THE IRON AGE

Established 1855 — New York, November 10, 1910 — Vol. 86: No. 19

Published Every Thursday by the
DAVID WILLIAMS COMPANY
14-16 Park Place, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Single Copies, 20 Cents.

CHARLES T. ROOT, - - - - - PRESIDENT
W. H. TAYLOR, - - - TREASURER AND GENERAL MANAGER
HAROLD S. BUTTENHEIM, - - - - SECRETARY

GEO. W. COPE, - - - - - } EDITORS
A. I. FINDLEY, - - - - - }
H. R. COBLEIGH, - - - - - MECHANICAL EDITOR

Branch Offices

Philadelphia, Real Estate Trust Building — Chicago, Fisher Building
Pittsburgh, Park Building — Cleveland, American Trust Building
Boston, Compton Building — Cincinnati, 807 Andrews Building
Milwaukee, 1417 Majestic Building.

CONTENTS.

Editorial:	PAGE.
Still an Uncertain Market	1053
Steel Works Labor Conditions	1054
A New Record in Iron and Steel Exports	1054
Light Upon the International Steel Conference	1055
Gratuities to Influence Sales	1055
Orderliness as a Cost Factor	1056
Correspondence	1056
The John Fritz Medal Award for 1910	1057
The Philadelphia Foundrymen's Association	1057
The Blindness of Single Spaced Correspondence	1057
October Copper Production and Stocks	1057
Pig Iron Production. Illustrated	1058
The Jones & Laughlin Wire Catalogue	1059
The Iron and Metal Market Reports	1060 to 1068
Iron and Industrial Stocks	1068
The Otis Steel Company's Increased Earnings	1068
Trade Publications	1069
The Pittsburgh Metal Products Company	1069
Cincinnati Machinery Trade Activity	1069
Republic General Offices to Go to Youngstown	1069
Iron and Steel Analysis	1070
The Machinery Market Reports	1071 to 1080
Employers' Liability in Ohio	1080
Ore Dock Construction Halted	1081
Lake Superior Ore Shipments in October	1081
The British Steel Industry	1082
Improvements at Michigan Charcoal Furnaces	1082
Pittsburgh Steel Company Blast Furnaces	1082
Death of Philip Corbin. Portrait	1083
Personal	1084
Gulf Coast Commercial Matters	1084
Obituary	1084
Production of Wire Nails and Cut Nails in 1909	1085
September Exports and Imports of Iron and Steel	1085
Aluminum Welding and Brazing	1086
The Charles G. Stevens Company's New Warehouse	1086
An Effective Hot Blast Patch. Illustrated	1087
Shop Changes Due to the Steel Car	1087
The Hendey Quick Threading Attachment. Illustrated	1088
The Surrell Boiler Furnace. Illustrated	1089
Railroad Equipment Orders	1089
The Wilmarth & Morman Lathe Center Grinder. Illus.	1090
A 40-Ton Cyclone Hoist. Illustrated	1091
Machine Tools from the User's Standpoint	1092
New Lang Tool Holders. Illustrated	1094
The Rockford 15-In. Lathe. Illustrated	1095
The Weinberg Revolving Cylinder Gas Engine. Illustrated	1096
A Hawthorn Flaming Arc Light Installation in a Gun Shop. Illustrated	1097
The Niagara Automatic Feed Squaring Shear. Illustrated	1098
Kane & Roach Wire Straighteners. Illustrated	1098
Test of the Miraflores Boiler Plant. Illustrated	1099
Rolling Mill Machinery. Illustrated	1100
Kilbourne & Jacobs Special Steel Tunnel Car. Illustrated	1102
Production of Charcoal Bloomaries in 1909	1102
A Dodge Short Center Rope Drive. Illustrated	1103
Ferro-Lithic Plates for Concrete Construction	1103
The Keller Duplex Vacuum Cleaner. Illustrated	1104
A Pridmore Rock-Over Molding Machine. Illustrated	1105
The Minnesota Steel Company's Plant	1105
Current Metal Prices	1106

Still an Uncertain Market

Large Rail Contracts Expected This Month

Further Pig Iron Curtailment—Sales of Bessemer Iron at Lower Prices

An election result with so few surprises as are found in Tuesday's returns could not have an important effect upon business. The campaign saw no placing of orders for iron and steel contingent upon the election outcome, in the way that has often been done. Leaders in the trade are now simply waiting for events, with no definite expectation of anything beyond what has already been indicated concerning rail purchases. In making up their orders at this time for 1911 the railroads are only making the usual provision for early rollings to insure spring deliveries. Beside the Erie order, already noted, no rail contracts for 1911 are reported, though the Norfolk & Western is figuring on 30,000 tons, which will probably be divided between two manufacturers, while the Burlington has been added to the list of roads negotiating for their requirements. It is expected that a large total of orders for 1911 will be on the books before December 1.

Curtailment of pig iron production continues, but steel companies have done all of it in the past month. Of merchant furnaces as many blow in as go out. The United States Steel Corporation now has 50 furnaces out, as against 45 on October 1. The independent steel companies blew out six furnaces in October. The Steel Corporation will blow out one Duquesne and one Edgar Thomson furnace this week and will bank one at Bellaire. Its active furnace capacity, now 63 per cent., will then be about 61 per cent.

In October the total output of coke and anthracite pig iron was 2,087,385 gross tons, or at the rate of 67,335 tons a day. This compares with 68,542 tons a day in September, and is the smallest rate since July, 1909. The active capacity at the opening of this month was 65,826 tons a day for 231 furnaces, or 1700 tons less than for 239 furnaces on October 1. Stocks at furnaces increased in October. Pig iron production on November 1 was at the rate of 24,350,000 tons a year, or about 1,400,000 tons less than the average of 1907 and 1909.

Pig iron buying has broadened somewhat in the Central West, but has been less in the East than the average for October. Bessemer iron has broken through $15, at Valley furnace, and one round lot was sold for delivery in the first half of 1911 at $14.60. Inquiry for basic iron is pending in the East, but furnaces and buyers are some distance apart.

In foundry iron prices have not yielded in the past week in the way noticed in the two preceding weeks. Producers having taken a certain amount of first quarter business at low prices are not eager for more of the same sort. That is about the extent of the so-called improvement in the situation. Chicago and Buffalo

report considerable activity. One radiator interest has continued its recent buying, placing a considerable order for its Western works. A 5,000-ton sale of malleable Bessemer for delivery over the first half of 1911 was made at $14.50, Buffalo furnace. Alabama furnaces have had but a small share of the 1911 business thus far placed, buyers holding out strenuously for an $11 basis.

In most finished materials the week has shown a falling off both in new orders and specifications. While a hopeful view prevails it is admitted that there must be a marked quickening of the pace to insure even fair operation of the mills this winter.

Orders for wire products closed in October exceeded those for September, and wire is still the leader in activity.

Several inquiries for wrought pipe for both gas and oil lines have come up in the past week, one being from the Tri-County Gas Company for 80 miles of 2 to 10 in. pipe, and another of good size from a Canadian company. Merchant pipe is bought more freely for replenishment of stocks.

The copper producers' report for October, showing some increase in production, and yet large enough deliveries to reduce stocks has been interpreted as favorable on the whole, and predictions are made of a considerably larger reduction of stocks this month. Prices have advanced an eighth, at all events, to 12.87½ cents for electrolytic and 13 cents for lake, with cautious buying by consumers.

Steel Works Labor Conditions

We have already referred (*The Iron Age*, October 13, 1910, page 841) to the investigation of labor conditions in the iron and steel industries now being conducted by the Bureau of Labor of the Department of Commerce and Labor, in pursuance of resolution No. 237 of the United States Senate, calling for full information in regard to wages and hours of labor in iron and steel manufacture. To furnish the information called for in the numerous blanks sent out to iron and steel manufacturers will involve a large expenditure for clerical and other labor, as may be judged from the fact that complete scales of wages are wanted for the years 1900, 1905 and 1910, while an even more burdensome inquiry deals with accidents. Details are called for of every accident in iron and steel works in the United States in the two years ending June 30, 1910. In the same connection particulars are asked for of appliances installed for preventing accidents with results from their adoption. A much more voluminous report can be made in response to this latter inquiry than would have been the case two or three years ago, the activity of iron and steel manufacturers in the interim having been particularly noteworthy in this direction.

An unusual feature of the inquiry now being conducted by the Bureau of Labor is that its representatives are visiting steel plants and directly interrogating employees as to prevailing conditions. Such questioning may result in great injustice to manufacturers if the information secured from employees is not checked up by being brought to the attention of those in charge of operations. Very much will depend, in this connection, on the familiarity of the investigator with the operations about which he asks. Some of those who gathered the materials for the Pittsburgh Survey, for example, might have profited much by discussing the matters of which they treated with those familiar with labor conditions in iron and steel manufacture. A very different light is thrown, for example, upon the 12-hour shift at blast furnaces by a statement of the actual working time of employees, the character of the work done and the amount of waiting time included in the 12 hours. The fact that employees, when given a choice between 10-hour and 12-hour jobs at the same hourly rate choose the latter, is also to be considered. The hard conditions of 12-hour labor are oftentimes products of the imagination of the inexperienced investigator. There are some evidences of this in the publication made by the Bureau of Labor concerning conditions at the works of the Bethlehem Steel Company. The Bureau will be but doing simple justice if, in advance of publication, it discusses the reports of its agents with those who have long been in positions of responsibility in the iron and steel industries.

Concurrently with the Government investigation the American Iron and Steel Institute's committee of five, composed of presidents of important steel companies, is gathering data concerning Sunday labor at iron and steel works, and particularly seven-day labor in the continuous processes. Apropos of this latter inquiry, it may be said that the efforts thus far made to reduce the amount of Sunday labor at steel works have produced one important argument not included in the original statement of the case, and that is that the small repair forces now at work on Sunday accomplish as much as the much larger forces which did Sunday work under the old régime. The economic argument thus strongly reinforces those based on ethical grounds.

A New Record in Iron and Steel Exports

It is highly interesting to note that 1910 is making a new record in international trade in iron and steel, at least so far as finished materials are concerned. The statistics for the first nine months of the year show that Great Britain, Germany and the United States have had a larger export trade in finished and semi-finished iron and steel than in any like period in their history. Leaving out iron ore and old material, the total of iron and steel exports from Great Britain for the three quarters was 3,434,000 gross tons, against 3,074,000 tons to September 30, 1909; 3,109,000 tons in 1908 and 4,002,000 tons in 1907, which was the year of largest exportation. The pig iron movement was responsible for the record made in 1907, however, the total of pig iron, including ferromanganese and spiegeleisen, for the first nine months amounting to no less than 1,554,000 tons, whereas this year the pig iron exports have been 922,000 tons. Finished and semi-finished materials thus amount to 2,512,000 tons this year, against 2,448,000 tons in 1907. Prices have not been as high this year as in 1907, the total value of iron and steel exports for the first nine months of 1910 being £31,935,000, as against £35,623,300 in the first three quarters of 1907.

Germany, which in the past two years has been pressing Great Britain closely in exports of iron and steel, is likely to forge ahead in 1910. The statistics for the first three quarters of the year show exports of 3,461,186 metric tons from Germany, leaving out ore

and old material. This is equivalent to 3,405,000 gross tons, or only about 29,000 tons less than the total for Great Britain. Germany has a strong lead over Great Britain, however, in exports of finished and semi-finished materials, as only 364,761 tons of the above amount is pig iron, while Great Britain's total includes 922,180 tons of pig iron in the first three quarters of this year.

It is already evident that the United States will make a new record in iron and steel exports in 1910. So far as sales for export are concerned it has already been noted that for several months past these have been averaging 25,000 tons more than for the corresponding months of 1909. For the nine months ending September 30 the total, leaving out ore and old material, was 1,063,430 gross tons, or about 225,000 tons more than in the corresponding period of 1909.

There are cross currents in the iron and steel trade of the three leading countries, and it cannot be said now just how the balance stands between Great Britain, Germany and the United States. It can be said, however, that 1910 will show a new record in the consumption of iron and steel products in neutral markets, as it will show a new record for the total production of the United States, Germany and Great Britain.

Light Upon the International Steel Conference

The London *Iron and Coal Trades Review*, after due deliberation upon the objects of the American Iron and Steel Institute, and particularly on the purposes of the recent New York meeting to which representatives of the iron and steel industries in European countries were invited, comments as follows:

> The object is not to foster a definite international price agreement, but rather to encourage friendly rivalry instead of injurious competition. This is Judge Gary's way of putting it. American participation in the international steel trade is not very large at present, and the extent of the participation is probably pretty well governed by unwritten principles already, but through what the Institute accomplishes Judge Gary no doubt expects the participation to be increased. Again, there is the certainty that while the Payne-Aldrich Tariff bill of 1909 materially reduced Iron and steel duties, another revision is coming in the not distant future, and it is likely to make much more serious breaches in the tariff wall. It is not to be supposed that British manufacturers could make serious inroads in American domestic trade, in point of tonnage, for what would be a large tonnage to any of the European countries would be a relatively small tonnage to the Americans, but what a low tariff or free trade basis could easily bring about would be reduction in American exports through European manufacturers threatening disturbance to American domestic trade by occasional incursions. British or German manufacturers might not be able to export regularly and steadily to the United States, but by occasional sales they could break the best American market, and the price of their abstention would be the limiting of American exports to a certain figure. The lower the American tariff, the higher price, through limited exports, American manufacturers must pay in order to be let alone. Judge Gary wants to have the terms as liberal as possible, and one means is to advertise, through this new Institute, American willingness to be friendly, and its ability to manufacture cheaply. To-day we are more sure of Judge Gary's friendliness than of his ability to manufacture cheaply.
>
> It is not an uncommon experience that employers of labor, in making friendly advances to their employees, are considered by the latter to have thus given evidence of weakness, if not of fear of what their employees might compel them to grant. We have in the above extract a remarkable illustration of what may be conjured up against the friendly proposals of an advocate of co-operation among manufacturers. Those who participated in the New York meeting now have the key to every chamber and recess of the minds that conceived it. And the final sentence of the comment exposes the fear that was companion to the friendliness!

But lest this London expression be taken too seriously, it may be well to add another extract from the same article, which unmasks the real situation as to this country's "ability to manufacture cheaply":

> The Gary plant, . . . it is well to observe, involves a computed expenditure of some £15,000,000 (outside of coal mines, ore mines and ore carrying facilities) with an output of some 1,200,000 tons of finished products a year, largely rails; in other words, £12 10s. invested in plant per ton of annual output. Including the capitalization in ore, coal and transportation, together with royalties, there is an interest, royalty and depreciation charge of not very far from £2 per ton of finished product.

The builders of the Gary plant probably little dreamed that the work they have prosecuted with such pride would so soon compel international negotiations to insure its operation at a profit. After saddling their product with a $3.12½ charge per ton (at 5 per cent.) on construction alone, they might have contrived in some way to cut loose from the ore, coal and transportation facilities and, by buying raw materials in the market, have saved the remainder of the $10 handicap against every ton of steel they produced. Then, too, our contemporary might have missed the delectation of building its man of straw.

Gratuities to Influence Sales

The recent trials involving corruption in connection with the repair work of one of the railroad systems of the Middle West call attention to the utter uselessness of the legislation passed by a number of States striking at all forms of gratuities in connection with sales of goods. It has long been recognized that presents of money play a part in the transaction of business. A generation ago the practice was more prevalent; better systems of buying now make it more difficult. But the favor of some employees, in positions both high and low, still has to be secured by this dishonorable means.

In certain works and in isolated departments of others the salesman finds it absolutely necessary if he is to secure the business. The owner pays the bill usually, for the price is made to include the gratuity. Men who come in frequent contact with subordinates in plants assert that the custom is just as prevalent as it was five years ago, before laws were made providing a penalty of fine and imprisonment for both the receiver and the giver of the inducement. No necessity for concealment exists, excepting from the owners, for the law became practically a dead letter from the moment of its passage.

The fault lies with the employer. If he were anxious to get at the reasons for the selection of purchases for his plant he could discover the offender with no great amount of trouble. Usually the condition is well known to many salesmen. A reputation is made, knowledge of which spreads quickly. The owner, by ridding himself of this form of parasite, would reduce his costs, for corruption means expensive buying. The great majority of employees are honest men, but occasionally among them is a rascal who sees no wrong in enriching himself whenever and however possible. If a man is dishonest the trait will express itself in other ways should the occasion offer. Those who looked to see the terror of the law bring an end to "grafting" in the works now realize, if they have

given the subject thought, that the remedy must be one of shop discipline, administered after watchful investigation.

Orderliness as a Cost Factor

In many manufacturing plants a source of waste is the lack of orderliness. While synonymous with neatness, the word has a meaning which reaches much further in its application to a shop or factory. It includes the essence of the adage "a place for everything and everything in its place," taking into account not only tools, jigs, fixtures and parts awaiting assembling or further operations, but finished pieces in process of assembling, as well. This is particularly true in manufacturing, where a workman specializes within narrow limits of production.

An example of the practical value of orderliness may be given. In a factory manufacturing electrical appliances a certain apparatus, produced in great numbers was assembled by operatives at the average rate per man of 12 a day. It contained a large number of pieces and required the use of various sizes and forms of screws. A young man was put to work on the job. He proved slow and gave poor satisfaction in the beginning, and was even derided by his fellows. But he possessed a large bump of orderliness and the capacity to study his work, and as a consequence evolved a system of laying out his work on the bench for greater convenience in handling it. Each piece was in the sequence of its assembling. Each kind of screw was isolated in a position of convenience proportional to the frequency of its use. Once he had determined upon his system he adhered to it. The result was a machine-like facility of operation. Hand and brain were coordinated by constant practice to a very high degree of efficiency, vastly increasing production, and at length a capacity of 50 per day was reached. The superintendent realized that such a man should not be wasted at a bench and made him foreman of instruction in this department. He trained the men in the use of his system and they were given to understand that thereafter 50 and not 12 pieces were the day's work, and they did it.

Few works exist where examples cannot be found to prove a similar need of better systems, though in most cases the waste would be less pronounced. A large percentage of shop benches show an inclination toward disorderly methods. Frequently men are seen searching for a part or a tool in a miscellaneous collection of articles lying about helter skelter. In old fashioned shops, where benches and the spaces beneath them and every other corner are full of evidences of disorderliness and slovenliness, the waste is criminal in the eyes of the progressive manufacturer. Yet a similar condition, on a less scale, may be present in his own shops. The introduction of a premium system reveals the presence of this fault. So also does concentrated effort on the part of superintendent and foremen.

In recent weeks manufacturers in various metal working lines have had more opportunity than for some time to select the most suitable men from among those applying to them for employment. The various employment bureaus of the metal trades associations note that fewer men from among those sent out from their offices are given places. Manufacturers have been able under such conditions to strengthen their forces by bringing up the efficiency average.

Correspondence

Preventable Blast Furnace Accidents

To the Editor: Mr. Sweetser's article on preventable blast furnace accidents is timely and to the point. On the whole, he covers the ground well and gives good advice. Regarding gas explosions, he says: "Some of the most disastrous accidents around blast furnaces are those due to gas explosions, and many lives have been lost and much property has been destroyed by their terrific force."

While these disastrous explosions considered by themselves are not numerous, considering the total number of furnaces, the fact that they can and do occur should be sufficient warning to the responsible parties; not only should every precaution be exercised to minimize the possibility of their occurrence, but if a sure preventive method exists it should be applied without delay.

Mr. Sweetser says further: "The waste gas of a normal furnace is not a dangerously explosive mixture, and is not even very rich in fuel gas, and its control is a comparatively easy matter. Yet when the furnace is stopped for a few minutes and the blast put on again there *could* (italics are Mr. Sweetser's) be an explosion of this normal gas, providing that the gas accumulates where it is mixed with air and is then ignited." There is, therefore, a possibility of an explosion after every stop, even with normal gas containing from 70 to 75 per cent. of incombustible constituents, and this possibility becomes a probability when the gas becomes mixed with an appreciable per cent. of hydrogen due to a leaky tuyere or bosh plate.

Mr. Sweetser advocates keeping both bell and bleeders closed while the blast is off. This is good advice, provided your bleeders are perfectly tight, your explosion doors do not leak and your burner valves are all tightly closed at the same time. The fact is that bleeders, if they are used at all, never close tightly, and explosion doors always leak more or less; and if matters could be thoroughly investigated it would be found that the explosion doors are the cause of nine-tenths of the explosions which they are designed to make ineffective. That leaks and crevices exist even in the best constructed and well supervized gas main systems of modern blast furnaces is admitted by Mr. Sweetser when he says: "To prevent explosions of the blowing-in gas, all fire must be kept away from the gas burners at stoves and boilers until the pressure of the gas forces it through every crack and crevice of the whole gas main system." There are not a few practical blast furnace men who insist on opening the bell and bleeders wide whenever the blast is taken off and on opening the dust catcher below, thus sweeping the downcomer clear of gas and permitting the boiler burners to draw the gas from the gas main, trusting to the volume of gas to shove the air out ahead of it when the blast is put on, and it is claimed for this method that it insures a minimum danger from explosions.

There are many ways by which the danger of having gas explosions, both in blowing in and after stops, can be and are minimized. Every practical blast furnace man has a way derived from experience which is more or less satisfactory to himself. Not one in ten of the practical blast furnace men would frankly acknowledge that they cannot be sure of handling blast furnace gas without imminent danger. There are very few who have had the sad experience of a disastrous explosion. It is a safe assertion, however, that there is not one blast furnace man whose experience covers a term of years who has not experienced some more or less

serious gas explosions, to say nothing of the innumerable minor explosions or so-called kicks or puffs. The writer speaks from 15 years of practical experience, during which time he had one serious gas explosion and an untold number of minor ones. Sometimes there would be a period of several months without a puff, and then again an interval where there would be hardly a stop without a kick or two in spite of all precautionary efforts. Generally the cause would be discovered and removed; often not.

Mr. Sweetser's suggestions for preventing gas explosions are laudable, and if properly carried out may be more effective than many others; but, like all precautionary methods, they minimize the probability but do not exclude the possibility of having gas explosions. There is only one way to prevent blast furnace gas explosions, in blowing in as well as in blowing up after stops or shutdowns, and that is to drive out all the air from the dust catcher, downcomer and gas main with a gaseous medium which is neither combustible nor a supporter of combustion, just before putting on the blast. Any neutral gas will answer the purpose, but steam is the most available and easiest to apply and is, therefore, the medium used.

This method was first conceived and successfully applied by J. W. Dougherty something over six years ago. It has been in continuous use at the furnaces of the Pennsylvania Steel Company for the past five years. Its effectiveness having been thus thoroughly established, the writer undertook its introduction at other furnaces. Within the past year ten other furnace plants have adopted Mr. Dougherty's method. The license fee is exceedingly moderate, the cost of installation in no case will exceed $25 and the up-keep is practically nil.

E. A. UEHLING.

PASSAIC, N. J., November 4.

The John Fritz Medal Award for 1910

The John Fritz medal, established in 1902 in honor of Mr. Fritz on his eightieth birthday, has been awarded for this year to Alfred Noble, past president of the American Society of Civil Engineers, "for notable achievements as a civil engineer." The presentation will be made Wednesday evening, November 30, at the house of the American Society of Civil Engineers. Dr. Samuel Sheldon will preside and addresses will be made by Isham Randolph and Dr. R. W. Raymond. The awards of the John Fritz medal have been as follows: In 1905 to Lord Kelvin, "for his work in cable telegraphy and other scientific attainments"; in 1906 to George Westinghouse, "for the invention and development of the air brake"; in 1907 to Alexander Graham Bell, "for the invention and introduction of the telephone"; in 1908 to Thomas Alva Edison, "for the invention of the duplex and quadruplex telegraph, the phonograph, the development of a commercially practical incandescent lamp and the development of a complete system of electric lighting, including dynamos, regulating devices, underground system protective devices and meters"; in 1909 to Charles T. Porter, "for his work in advancing the knowledge of steam engineering and in improvements in engine construction."

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its regular monthly meeting at the Manufacturers' Club, Philadelphia, on the evening of November 2, with President Thomas Devlin in the chair. The Railway Material Company, Phoenixville, Pa., represented by Charles H. True, was elected to active membership. After discussion, the association by motion favored the selection of San Francisco, Cal., as the location, in 1915, for the exhibition commemorating the opening of the Panama Canal. An interchange of views regarding trade conditions followed. While reports showed a variance, the anticipation of more activity in the not distant future was general. The meeting concluded with an interesting address by President Devlin, descriptive of his foreign travel during the summer.

The Blindness of Single Spaced Correspondence

Two essentials of business correspondence are that every letter shall be carefully scrutinized by its writer before mailing and that it shall be intelligible to its recipient without demanding of him any unusual effort. Great risk of failure in both these respects comes with closely spaced typewriting. Single spacing brings the lines so nearly together that, unless the eyes are concentrated to an unusual degree, the words above and below merge most confusingly with those that are being read, especially with men whose eyesight is not normal. When a letter contains only a few lines the practice does not matter so much, but many houses, happily in decreasing numbers, employ the concentrated method on all of their correspondence. Even quotations of prices are run into the lines of a paragraph, instead of being paragraphed individually. Nothing is more confusing, and to most people more annoying, than to try to separate numerals that are jammed closely together. Business men are even compelled to have their own operators rewrite such correspondence that it may be easily digested.

The evil is removed by the setting of all typewriters of an office for double spacing. Possibly this means a slightly increased cost for stationery, and letter books may fill more rapidly. In a great majority of cases however, business letters cover only a single sheet with double spacing. Letter books are rapidly giving place to carbon letter copies. But, whatever the economy of single spacing, it is small enough compared with the results which may follow the necessarily rapid reading of letters. It is very important that the meaning be clear, visually as well as in the wording. Otherwise, complications may ensue in succeeding correspondence, until the outcome of the original misunderstanding may be serious. Such cases are by no means unknown, and the blindness of close spacing is an important contributory cause.

October Copper Production and Stocks

The report for October of the Copper Producers' Association shows a reduction in stocks of 9,531,800 pounds from October 1 to November 1. The report is as follows:

Stock of marketable copper of all kinds on hand at all points in the United States October 1	148,793,714
Production of marketable copper in the United States from all domestic and foreign sources during October	126,469,284
Deliveries of marketable copper during October:	
For domestic consumption	67,814,172
For export	68,186,912
Total	136,001,084
Stock of marketable copper of all kinds on hand at all points in the United States November 1	139,261,914

The reduction of stocks thus shown is smaller than had been expected. It compares with a reduction in the previous month of 20,087,531 pounds. It may be said, however, that the September reduction was much greater than expectations. The production of October, a 31-day month, was, of course, larger than that of September, which was only a 30-day month. This partly accounts for the smaller stock reduction in October.

Pig Iron Production

A Decreased Rate in October

A Net Loss of Eight Furnaces and of 1700 Tons a Day in Capacity

Curtailment of pig iron production continues. In October the total output of coke and anthracite iron was 2,087,385 gross tons, or at the rate of 67,335 tons a day. This compares with 68,542 tons a day in September and is the smallest rate since July, 1909. The entire reduction is in steel works furnace operations, the production of merchant furnaces being stationary. Seventeen furnaces were blown out and nine were blown in last month, leaving 231 furnaces in blast November 1, a net loss of eight. The active capacity at the opening of this month was 65,826 tons a day, or 1700 tons less than on October 1.

Estimating charcoal iron, pig iron production November 1 was at the rate of about 24,350,000 tons a year, or about 1,400,000 tons less than the average of 1907 and 1909. The domestic production of ferromanganese and spiegeleisen in October, 8500 tons, was the smallest since December, 1908.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with October, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
October, 1909	57,067	26,789	83,856
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,876	27,740	85,616
March	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963
September	47,007	21,536	68,542
October	45,794	21,541	67,335

October Output by Districts

The table below gives the production of all coke and anthracite furnaces in October and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	June. (30 days)	July. (31 days)	August. (31 days)	Sept. (30 days)	Oct. (31 days)
New York	163,575	162,901	158,666	148,999	147,894
New Jersey	18,443	18,962	19,177	18,773	13,379
Lehigh Valley	66,944	61,014	63,878	63,919	69,327
Schuylkill Val.	60,349	61,340	64,926	60,689	61,673
Lower Susquehanna and Lebanon Val.	60,315	60,043	54,442	53,750	54,072
Pittsburgh dis.	483,909	502,711	510,352	505,342	507,508
Shenango Val.	130,290	113,280	113,500	108,114	112,026
West. Penn.	132,344	129,786	116,117	115,622	126,098
Md., Va. and Kentucky	82,181	75,051	76,477	68,398	67,926
Wheeling dis.	76,166	73,164	68,341	74,143	76,581
Mahoning Val.	208,988	215,282	211,575	201,986	202,667
Central and North. Ohio.	145,393	139,627	122,960	111,958	117,902
Hocking Valley, Hanging Rock and S.W.Ohio.	41,521	30,163	32,490	27,657	24,029
Mich.,Minn.,Mo., Wis.,Col.,Wash.	68,051	65,863	66,096	63,935	72,825
Chicago dis.	328,953	264,136	258,145	259,672	246,504
Alabama	160,970	143,313	140,015	148,755	160,077
Tenn., Georgia and Texas	37,086	31,806	29,690	24,563	26,897
Totals	2,265,478	2,148,442	2,106,847	2,056,275	2,087,385

There was a net loss of eight in the number of active furnaces between October 1 and November 1. Among furnaces blown out were the New York State Steel Company's stack at Buffalo, Oxford in New Jersey, one Crane and one Palmerton in the Lehigh Valley, one Paxton in the Lower Susquehanna Valley, one Duquesne and one Aliquippa in the Pittsburgh district, one South Sharon in the Shenango Valley, three Cambria in Western Pennsylvania, one Mingo in the Wheeling district, Madeline and one South Chicago in the Chicago district, and Sheffield, Williamson and one Sloss-Sheffield in Alabama.

Among furnaces blown in were Harriet Y at Buffalo, one Dunbar and Perry in Western Pennsylvania, Cherry Valley in the Mahoning Valley, one Federal in the Chicago district, one Mayville in Wisconsin, Zenith in Minnesota, and one Vanderbilt and Central in Alabama.

Capacity in Blast November 1 and October 1

The following table shows the daily capacity of furnaces in blast November 1 and October 1. These figures are based largely on the performance of the furnaces in the past two months:

Coke and Anthracite Furnaces in Blast and Capacity.—Gross Tons.

Location of furnaces.	Total number of stacks.	November 1. Number in blast.	November 1. Capacity per day.	October 1. Number in blast.	October 1. Capacity per day.
New York:					
Buffalo	17	13	4,135	14	4,335
Other New York	7	3	550	3	582
New Jersey	7	2	432	3	625
Spiegel	2	..	....	..	....
Pennsylvania:					
Lehigh Valley	23	12	2,076	13	1,970
Spiegel	3	1	90	2	161
Schuylkill Valley	16	7	2,010	7	2,023
Low. Susquehanna	7	4	802	5	913
Lebanon Valley	10	6	847	6	878
Pittsburgh district	50	38	15,483	40	16,433
Spiegel	3	1	114	1	130
Shenango Valley	20	10	3,226	11	3,487
Western Penn	27	14	3,295	15	3,704
Maryland	4	3	805	3	795
Wheeling district	14	7	2,420	8	2,510
Ohio:					
Mahoning Valley	23	18	6,837	17	6,333
Central and North.	22	10	3,803	10	3,715
Hocking Val., Hanging Rock and S. W. Ohio	15	7	775	7	758
Illinois and Indiana	31	20	8,050	20	8,410
Spiegel	3	0	0	1	155
Michigan, Wisconsin and Minnesota	10	7	1,340	5	905
Colorado, Missouri and Washington	7	4	1,100	4	1,096
The South:					
Virginia	23	10	1,140	10	1,150
Kentucky	5	2	348	2	359
Alabama	46	23	5,274	23	5,175
Tenn. and Georgia	20	9	874	9	910
Totals	415	231	65,826	239	67,512

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig. Total production. 1908.	1909.	1910.	Spiegeleisen and ferromanganese. 1909.	1910.
January	664,415	1,117,823	1,773,201	12,325	19,538
February	745,802	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,553	1,739,212	23,743	25,591
April	725,548	1,093,092	1,669,898	22,478	22,304
May	759,674	1,256,448	1,619,283	20,834	26,529
June	717,689	1,365,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,991	1,442,572	22,313	23,756
September	933,514	1,660,839	1,410,221	28,148	15,151
October	996,481	1,769,094	1,419,624	25,384	8,500
November	981,167	1,689,094	.....	23,376	.....
December	1,090,339	1,768,799	.....	20,791	.....

Graphic Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	39,610	59,232	84,459
April	73,885	38,280	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	36,444	64,656	75,516
July	72,763	39,287	67,793	69,305
August	72,594	43,851	72,546	67,963
September	72,783	47,300	79,507	68,542
October	75,380	50,554	83,856	67,335
November	60,937	52,595	84,917	.....
December	39,815	56,158	85,022	.....

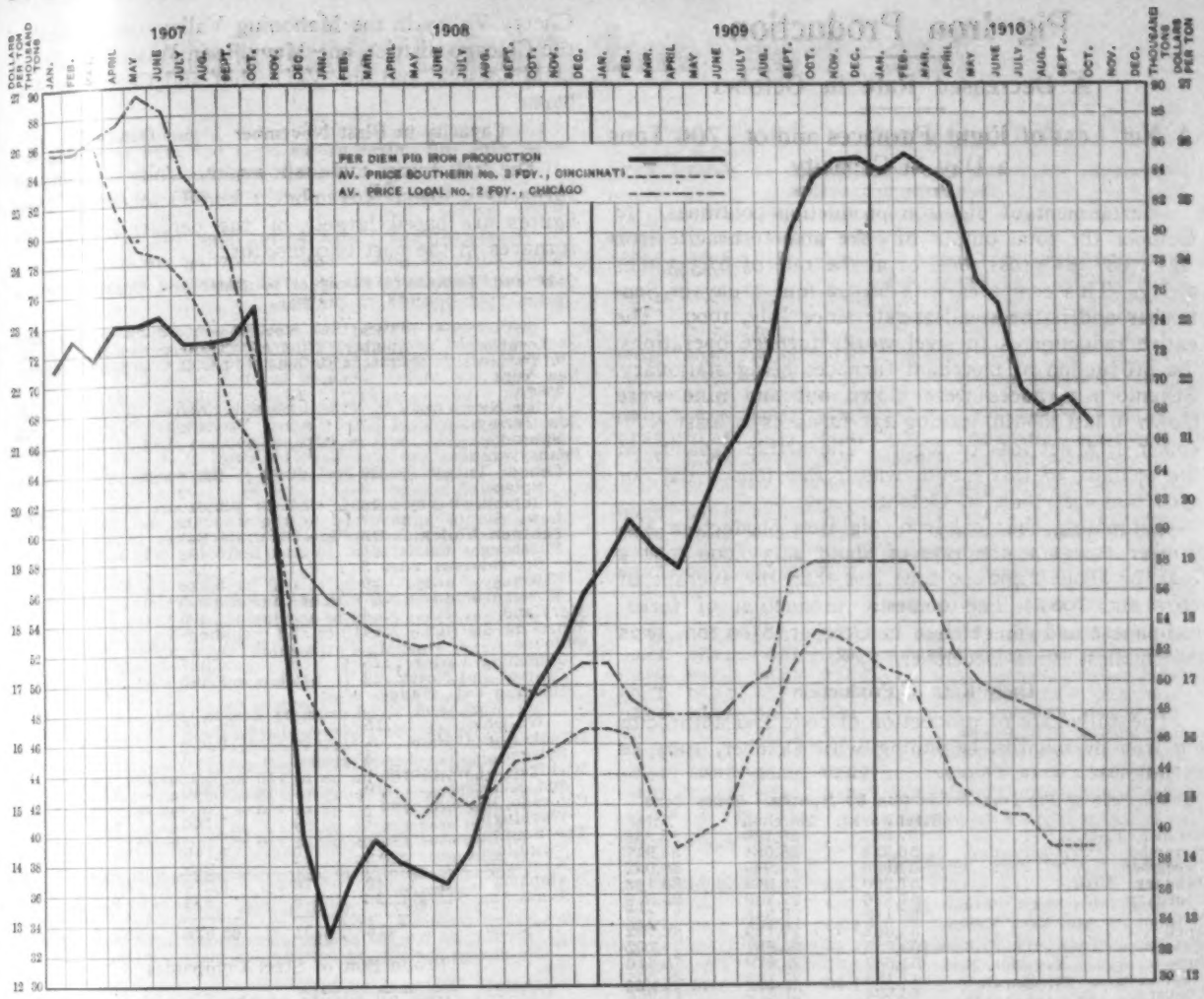


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to November 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron Delivered at Chicago.

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.83	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	14.25	16.40
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	14.25	16.06
Nov.	19.50	20.66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,250,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	2,056,275
October	2,336,972	1,567,198	2,599,541	2,087,385
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

Improvements are being made to the blast furnace of the Sharpsville Furnace Company, Sharpsville, Pa. These include a new hot blast, cold blast gas mains, three new stoves, and a spray type of gas washer, designed by Arthur G. McKee, Cleveland, Ohio. The stoves are already in and work will be started on the steel work shortly.

The Sheffield Coal & Iron Company, Sheffield, Ala., blew out on October 17 the one furnace it has been operating the past year.

The Jones & Laughlin Wire Catalogue

The Jones & Laughlin Steel Company, Pittsburgh, has issued its first catalogue on wire nails and wire products. It is an attractively illustrated booklet of thirty-two pages and contains much detailed information about the various brands of wire nails, wire rods, barb wire, staples, annealed wire, galvanized wire and other wire products now being manufactured in the new Aliquippa department of the company. The Jones & Laughlin products in iron and steel have been the standard of quality for 60 years, and the firm's long record of achievement and of fair treatment of customers in the steel trade is a guarantee for the new products it has just commenced to turn out at the Aliquippa Works. The sales head of the wire department is George A. Mason, personally known throughout the trade because of his long service with another company. Associated with him in the sales department are Thomas C. Ham and George E. Quigley, both men of experience in the wire business.

The Western Steel Corporation, Seattle, works at Irondale, Wash., has placed with Tate, Jones & Co., Inc., Pittsburgh, an order for Kirkwood oil burning appliances for its third open hearth furnace. It has been using two Kirkwood equipments for some time.

The W. F. & John Barnes Company, Rockford, Ill., was awarded a gold medal for its exhibit of machinery at the recent Brussels Exposition, particular mention being made of the completeness of its line of drilling machinery.

Josephine Furnace of Corrigan, McKinney & Co., at Josephine, Pa., will be blown out this week for relining.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 9, 1910.	Nov. 2, 1910.	Oct. 12, 1910.	Nov. 10, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.75	$15.75	$15.75	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.75
Foundry No. 2, local, Chicago	16.00	16.00	16.00	19.00
Basic, delivered, eastern Pa.	*14.75*	14.75	15.00	19.00
Basic, Valley furnace	**13.25**	13.00	13.10	17.25
Bessemer, Pittsburgh	*15.50*	15.90	15.90	19.90
Gray forge, Pittsburgh	14.15	14.15	14.15	17.15
Lake Superior charcoal, Chicago	*18.00*	18.00	18.25	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*23.50*	23.50	24.00	27.00
Forging billets, Pittsburgh	*28.50*	28.50	29.00	31.00
Open hearth billets, Philadelphia	26.00	26.00	26.00	30.60
Wire rods, Pittsburgh	*28.00*	28.50	28.50	32.50
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	17.25
Steel rails, melting, Philadelphia	*13.50*	13.50	13.75	18.00
Iron rails, Chicago	16.00	16.00	16.00	20.50
Iron rails, Philadelphia	18.00	18.00	18.00	21.00
Car wheels, Chicago	*13.50*	13.50	14.00	18.50
Car wheels, Philadelphia	13.75	13.75	13.75	17.50
Heavy steel scrap, Pittsburgh	14.25	14.25	14.25	17.50
Heavy steel scrap, Chicago	12.25	12.25	12.25	16.00
Heavy steel scrap, Philadelphia	*13.50*	13.50	13.75	18.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.37*	1.40	1.40	1.65
Common iron bars, Chicago	1.35	1.35	1.35	1.55
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.65
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1 40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	*1.25*	1.25	1.40	1.50
Skelp, sheared steel, Pittsburgh	*1.35*	1.35	1.50	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	*1.60*	1.60	1.65	1.80
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	12.87½	12.87½	13.25
Electrolytic copper, New York	**12.87½**	12.75	12.75	13.00
Spelter, New York	**5.95**	5.95	5.60	6.30
Spelter, St. Louis	**5.80**	5.80	5.45	6.15
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	4.30	4.27½	4.27½	4.25
Tin, New York	36.25	36.80	....	30.50
Antimony, Hallett, New York	*7.75*	7.75	7.87½	8.25
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.74

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.60c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets: Nos. 10 and 11, 1.85c.; Nos. 12 to 14, 1.90c.; Nos. 15, 16 and 17, 1.95c.; Nos. 18 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.15c.; Nos. 27 and 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.25c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c. Galvanized sheets, Nos. 10 and 11, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18, 19, 20 and 21, 2.60c.; No. 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in.	72	58	68	54
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	68	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
⅛ in.	64	58	60	54
¼ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	55	45

THE IRON AND METAL MARKETS

		Plugged and Reamed.	
1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.	
2, 2½ to 4 in....	Lap Weld		

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¾ to 2¼ in.	61	48
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.50.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter that 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, November 9, 1910.—(*By Telegraph.*)

Pig Iron.—Considerable new inquiry for pig iron has come up in the past week and some tonnage has been closed. A local consumer is reported to have bought one lot of 2000 tons and another lot of 3000 to 4000 tons of Bessemer at prices ranging from $14.60 to $14.75, Valley furnace. It is also reported that the Westinghouse Air Brake Company has bought 8000 tons of foundry and forge, but this is not confirmed. The General Electric Company is in the market for 6000 tons of iron, but none of this will come from local or Valley furnaces. The market on basic iron is stronger, due to the withdrawal of low prices put out some time ago by two furnace interests. We quote as follows: Standard Bessemer iron, for delivery through first half of next year, $14.60 to $14.75; malleable Bessemer, $13.75; basic, $13.25; No. 2 foundry, $13.75, and gray forge, $13.25, all at Valley furnace, the freight rate to Pittsburgh district being 90c. a ton.

Steel.—There is more inquiry for billets in small lots ranging up to 1000 tons, and there are also several large inquiries reported in the market for sheet and tin bars for first quarter. A sale of 500 tons of Bessemer sheet bars for November and December delivery is reported at $24.50, Pittsburgh. We quote Bessemer and open hearth billets at $23.50 to $24; Bessemer and open hearth sheet and tin plate bars, $24.50 to $25, and forging billets, $28.50 to $29, all f.o.b. Pittsburgh, Youngstown or Wheeling district.

Merchant Pipe.—The Moncton Tramway, Electricity & Gas Company, Ltd., Moncton, New Brunswick, is in the market for the pipe material for transportation of natural gas. The line is to be laid next spring, and the quantity involved is about 1600 tons.

(*By Mail.*)

The feature of interest in the iron trade this week is the break in prices on Bessemer pig iron, brought about by the placing of some fairly large tonnage for first half delivery. For several months the nominal price of Bessemer iron has been $15, at Valley furnace, but this price held only for the reason that not enough new business was being offered to thoroughly test the market. Recently a local interest bought 1500 tons for first half delivery at $15, Valley furnace, but last week a leading local consumer sent out inquiries for the same delivery for quite a large tonnage, and has closed for part of it on the basis of $14.60, at Valley furnace, or $15.50, Pittsburgh. The same interest is negotiating for another larger tonnage, which may be closed before this week is out. A little better inquiry is reported for steel billets in lots ranging from 200 tons up to 1000 tons, but prices continue weak. Conflicting reports are made regarding specifications against contracts received by the steel mills so far this month against the same period in October. Several large mills report their specifications better, while others state they show a large falling off as compared with the first week or 10 days in October. Consumers are buying only such quantities of material as are absolutely needed, while jobbers are merely purchasing enough to maintain stocks. Confidence in the future seems to be lacking. An encouraging feature of the situation is that on most orders placed there are requests for prompt shipment.

Ferromanganese.—The low prices ruling on foreign 80 per cent. for delivery through the first half have brought out some inquiry. Several large lots are under negotiation for delivery in the first six months, and one lot of 2000 tons for delivery over all of next year. A leading consumer is reported to have bought 1500 tons, deliveries 250 tons a month over the first six months at about $38.50, Baltimore. We quote foreign 80 per cent. at $38.50 to $39, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—Consumers are pretty well covered and there is not much new inquiry. There is a scarcity of 50 per cent. for prompt shipment, and it is bringing slightly higher prices than for forward delivery. We quote 50 per cent. for delivery over the first six months of next year at $55 to $55.50, and for prompt delivery at $56 to $56.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars, Jisco and Ashland furnaces.

Skelp.—One leading consumer has placed fully 9000 tons of steel and iron skelp in the past three or four weeks. We note a sale of 2000 tons of small sizes of grooved steel skelp at 1.25c., Pittsburgh. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Rods.—There is not much inquiry, only small lots being wanted for prompt shipments. Consumers are buying merely as their needs require. We quote Bessemer rods at $28 to $28.50, and open hearth and chain rods at $28.50, f.o.b. Pittsburgh.

Muck Bar.—Consumers being pretty well covered, while two of the local makers have their product pretty well sold up through the first quarter. We continue to quote best grades of muck bar, made from all pig iron, at $30 to $30.50, Pittsburgh, with Eastern muck bar still being offered in this market at about $29, delivered.

Steel Rails.—No domestic orders for standard sections of moment have been placed, but negotiations are now on between the Carnegie Steel Company and a number of leading roads that will probably develop into orders between now and December 1. A good many standard section rails are being rolled at the Edgar Thomson mill for export. New demand and specifications against contracts for light rails last week were better than the week before, the Carnegie Steel Company having taken close to 3000 tons. Under the arrangement recently made for quoting rails on a per pound basis, quotations on light rails are now as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are absolutely minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—No car orders have been placed in the past week and the whole plate trade is very dull. A number of the local plate mills were down last week for lack of orders, but are running again this week, though not to full capacity. No large business is in sight. The local market on ¼-in. and heavier plates in the wider sizes is 1.40c., Pittsburgh, but this is being shaded as a base price for delivery in certain districts. Narrow plates are still being sold at 1.35c., at mill.

Structural Material.—Inquiry in the past week has been light, and no large contracts have been given out in the local market. Several Western roads are inquiring for a good deal of tonnage for bridge work and some of these contracts are expected to be placed before the month is out. We continue to quote beams and channels up to 15 in. at 1.40c., f.o.b. Pittsburgh.

Sheets.—A fair amount of new tonnage has been placed for delivery in this and next month. Some mills are selling for delivery in first quarter at present prices, while others refuse to do so, believing the sheet market will be higher after the turn of the year. The market on sheets remains on the basis of 2.20c. for No. 28 one pass black sheets and 3.20c. for No. 28 galvanized, but in some cases, on nice specifications, these prices are shaded $1 a ton. The full schedule of prices now in effect on black and galvanized and on roofing sheets is given on a previous page.

Tin Plate.—In the last few days specifications have notably increased, and if this continues some of the capacity recently thrown idle will be started up again. Some heavy contracts for bright plate from the meat packing and condensed milk interests have been placed in the past week or two for delivery in the first quarter, and in some cases the second quarter. Prices on tin plate are firm, and we quote 100-lb. cokes at $3.60, base box, f.o.b. Pittsburgh.

Bars.—The amount of new business in both iron and steel bars is lighter now than at any time this year, being confined to small lots to cover actual needs. Consumers are not disposed to contract, not being assured that present prices on either iron or steel bars will be maintained. The railroads are buying very little. Specifications against con-

THE IRON AND METAL MARKETS

tracts for steel bars are coming in at a fairly satisfactory rate. The local market on steel bars is 1.40c., but for some points of delivery, notably in the Chicago district, this is being shaded as a basing price. We quote soft steel bars at 1.40c. in large lots and common iron bars at about 1.45c., Pittsburgh. Prices on the latter are weak.

Hoops and Bands.—Consumers are placing new orders only in small lots to meet current needs. Specifications have been a little heavier so far this month than in the first week in October. Prices are firm, and we quote hoops at 1.50c. in large lots, and 1.55c. in small lots; bands, 1.40c. in carload and larger lots, and 1.45c. in small lots, the latter carrying extras as given in the steel bar card lated September 1, 1909.

Cotton Ties.—The heavy demand is over, but consumers are specifying quite liberally against contracts. On shipments going out this month 77½c. per bundle is charged.

Spikes.—There is no improvement in the demand for railroad spikes. The railroads for some months have been buying only such quantities of spikes as are absolutely needed for repair work. It is believed, however, that after some rail orders are placed the demand for standard railroad spikes will show a material betterment. The demand for small railroad and boat spikes is quiet. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—Specifications on contracts are coming in at only a fairly satisfactory rate, but new business is only for small lots to cover actual needs. Material betterment in the demand is expected in the near future.

Spelter.—A number of large consumers have been holding off to see if a break would not come in the market, but stocks of some of them are getting very low and they will have to buy, in limited quantities at least, in the near future. We quote best grades of spelter at 5.75c., East St. Louis, equal to 5.87½c., Pittsburgh.

Merchant Steel.—Inquiry is light and has been for some time, while specifications against contracts are only fair. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ by ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.95c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—Several leading makers of shafting state that in the past two weeks specifications against contracts have been coming in at a little better rate, but new orders are only for small lots. It is believed that the demand from the automobile builders and implement makers will show material improvement within the next month or two, and early in the new year specifications are expected to be coming in more freely. Regular prices are being fairly well maintained.

Wire Products.—The demand for wire products and wire is only fair, jobbers and consumers placing orders only for such quantities as are needed to maintain stocks. Specifications against contracts are coming in fairly well, but the general condition of the wire trade is not as satisfactory as desired. The demand for cut nails is a little better, and specifications on contracts are reported as coming in a little more freely. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—Several large inquiries for both gas and oil lines have come up in the past week, one of these being from the Tri-County Gas Company for 80 miles of 2 to 10 in., and another from a Canadian company for a large quantity, but details are not ready to be given out. Mills report quite a good demand for merchant pipe, most orders carrying with them urgent requests for prompt shipment, showing that stocks held by distributers all over the country are very low. The stocks of pipe being carried by the mills at the present time are also lower than at any period this year, and the mills will enter the new year with their stocks well depleted and with every prospect of good business. It is stated that discounts on both iron and steel pipe, printed on a previous page, are being pretty firmly held.

Boiler Tubes.—There is absolutely no improvement in either demand or prices of boiler tubes, and the market is in very unsatisfactory condition, as it has been for practically all of this year. It is stated that in a good many cases iron boiler tubes are being sold below the actual cost of making them.

Iron and Steel Scrap.—This trade continues quiet, new inquiries from consumers being light and prices are only fairly strong. There is more activity in the demand for borings and turnings than for any of the other grades. The leading consumer of heavy steel scrap in this district is said to be pretty well filled up and has not been taking in much for some time. Prices on cast scrap and car wheels are lower. We note sales of about 1000 tons of cast iron borings on the basis of about $8 and about 1200 tons of machine shop turnings at a little above $8.50, Pittsburgh. Dealers quote about as follows, per gross ton, for delivery in the Pittsburgh district or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	13.00 to 13.25
No. 2 foundry cast	12.50 to 12.75
Bundled sheet scrap, at point of shipment	10.00 to 10.25
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	12.00 to 12.25
Low phosphorus melting stock	17.50 to 17.75
Iron car axles	24.50 to 24.75
Steel car axles	21.25 to 21.50
Locomotive axles	24.50 to 25.00
No. 1 busheling scrap	12.50 to 12.75
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	14.00 to 14.25
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.25
Machine shop turnings	8.50 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	15.00 to 15.25
Stove plate	11.75 to 12.00
Heavy steel axle turnings	9.75 to 10.00

Coke.—Standard grades of blast furnace coke are being offered as low as $1.50 per net ton, at oven, the lowest price reached for about three years. There is not much new demand for either furnace or foundry coke and prices are weak. The output in the Upper and Lower Connellsville regions last week was 345,000 net tons, a decrease over the previous week of about 5000 tons. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55, and for delivery over the first half of next year at about $1.75 per net ton, at oven. We quote standard makes of 72-hour foundry coke at $2 to $2.10 for prompt shipment and $2.25 up to $2.50 on contracts per net ton, at oven, for first half of next year. W. W. Peabody & Co., Uniontown, Pa., operators and shippers of coal and coke, report the business outlook more encouraging, and look for higher prices on both coal and coke in the near future. The firm has sold during the past 10 days, for November shipment, 18,000 tons of standard Connellsville furnace coke, and about 250 cars of foundry coke.

Chicago

FISHER BUILDING, November 9, 1910.—(*By Telegraph.*)

Notwithstanding the political uncertainty, which causes many buyers to await definite returns, some of the mills reported an increase last week in the volume of new business. The general tendency of the market, however, has been to wait until the financial world has adjusted itself to the results of the election. Conditions in the West continue very favorable. The wire mills in this territory are well employed, and new business in November is keeping up at the satisfactory rate that was reached in October. The hardware trade is good, and the manufacturers of agricultural implements report very satisfactory conditions in their field. The fabricating interests had a better week than for some time, and the market is sustained by the enormous amount of business in prospect. The railroads have been doing a little better in their purchases, but have not begun buying on the scale that is expected. Their operating departments are clamoring for materials, and requisitions are piling up in their purchasing departments, but the higher officials have been unwilling to release orders except for most urgent requirements. The earnings of the railroads, however, show a large movement of commodities this fall. Under the rules of the Interstate Commerce Commission the railroads have been charging to operating expense a fixed percentage for depreciation of equipment, whether the money is actually expended or not, and it is understood that a large fund has thus accumulated the past summer which will be available for the purchase of materials and equipment when the railroads begin their buying movement. The scrap market has been holding steady, but heavy stocks check any efforts of the dealers to obtain better prices.

Pig Iron.—The buying movement in pig iron, which was reported last week, has gathered satisfactory headway and has resulted in the placing of a considerable tonnage. It is understood that the buyers who were then reported in the market have purchased about 25,000 tons of Northern iron, principally foundry grades. The market for Southern iron also shows a tendency to broaden out, and more business has been done, principally in lots of 100 to 500 tons. Ala-

THE IRON AND METAL MARKETS

bama furnace interests, which have been holding off for some time, have begun to take contracts for first quarter and first half. In some cases iron is sold for second quarter to purchasers who will take a satisfactory tonnage for the first quarter, but there is talk of concessions in price on sales for first quarter, although most of the business is done at $11.50, Birmingham, while $11 continues the ruling price for November and December shipment, and there are more brands available at this figure for prompt shipment than a few weeks ago. The demand for prompt shipment is light and buyers are interested chiefly in prices for next year. There are good inquiries for charcoal iron, on which the business is not reported closed, and one Chicago foundry is inquiring this week for 2000 tons of malleable. The malleable foundries are usually anxious to cover their requirements at least six months ahead, but they have purchased very little this fall for delivery during the first half. The foundries making agricultural malleables have been running full, but the larger foundries, which specialize on railroad work, are carrying good stocks of iron and will not come into the market until they get more contracts for their product. On the whole, the feeling in the market has improved very materially in the past two weeks. The following quotations are for November and December shipment, Chicago delivery.

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.50 to 17.00
Northern coke foundry, No. 2	16.00 to 16.50
Northern coke foundry, No. 3	15.75 to 16.00
Northern Scotch, No. 1	17.00 to 17.50
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.00 to 16.50
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(By Mail.)

Billets.—The market is quiet, as business has been slack for some time in the forging shops, and only occasional orders are taken. The base price on forging billets, subject to concessions on desirable orders, is $28, Chicago.

Rails and Track Supplies.—There are more inquiries from minor railroads for small lots of rails up to 1000 and 2000 tons, but the leading Western railroads have not yet come into the market for 1911 contracts. Orders for light rails and track supplies are dropping off, but the roads continue to order small lots of track material for immediate shipment. We quote standard railroad spikes at 1.70c. to 1.75c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12-lb., $28, Chicago.

Structural Material.—While only one small building contract was let in Chicago last week the total of fabricated business in the West shows considerable improvement over preceding weeks. The bulk of the business was taken by the leading interest. The Oregon Trunk Railway, a new Hill line in Oregon, has let to the American Bridge Company contracts for bridges amounting to 1800 tons. As the Hill interests are very conservative in buying the placing of this business is taken as a favorable sign in the market. The United States Government has awarded to the American Bridge Company, through the Mississippi River Improvement Commission, a contract for river barges which will require 3000 tons of fabricated material. The American Bridge Company has booked 100 tons for a foundry building for the Imperial Iron Works at Duluth, 100 tons for the Peery Hotel at Salt Lake, Utah, and 900 tons for buildings for the American Beet Sugar Company at Huntington Beach, Cal. The Chandler Apartment Building in Chicago, 250 tons, was let to the Morava Construction Company of this city. It was reported last week on apparently good authority in this market that the mill order for the Heisen Building had been increased to 8000 tons, but it now appears that this report was premature. A majority of the mills report an improvement in orders and specifications for plain material, with the minimum price generally held at 1.40c., Pittsburgh. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—While it is known that Western roads have prepared data for large car orders, the business has not developed far enough to result in orders or inquiries from the mills for steel. There is a fair inquiry for tank plates as well as car shop material for repair work. There are more reports of concessions on plates than on any other material, but the leading mills continue to hold 1.40c. as their minimum. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The sheet business is holding up better than any other line of finished material, and a strong market is looked for when conditions become more settled after the election. The steady advance in spelter has had a tendency to strengthen the market for galvanized sheets, and it is suspected that the sheet interests have been heavy buyers of spelter to cover their future requiremnts. The store demand for sheets is exceptionally good. Based on the price of 3.20c., Pittsburgh, for No. 28 galvanized, in carload lots to jobbers, the differentials ruling in the Chicago market are as follows: No. 30, 3.68c.; No. 29, 3.48c.; No. 28, 3.38c.; No. 27, 3.23c.; Nos. 25 and 26, 3.08c.; Nos. 23 and 24, 2.88c.; Nos. 18 to 22, 2.78c.; Nos. 15 to 17, 2.63c.; Nos. 12 to 14, 2.48c.; Nos. 10 and 11, 2.38c. The differentials on black sheets remain unchanged. No. 10 blue annealed sheets are quoted at 1.83c., Chicago, and No. 28 black, 2.38c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—The weakness this fall in prices of all finished materials has had a somewhat dampening effect on specifications, as buyers on yearly contracts do not get the benefit of any decline in the market price on material that has been already specified. The market, however, has been holding steady in the case of bars, and large buyers do not seek a decline, as it would unsettle their costs and selling prices on their manufactured product. A slight turn for the better in the market will eliminate the concessions that have been made by smaller mills. There is some improvement in the railroad demand for bar iron. A month ago the purchasing departments were restricted to 100-ton orders, but in the past 10 days they have been able to specify in 200 and 300 ton lots for prompt shipment. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.35c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.50c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Sales by the leading interest during October reached a larger total than the record for September, which had been considered a very satisfactory month. November is starting in at the same rate as October and steady buying is looked for until severe weather stops outdoor work. Jobbers and dealers are carrying small stocks and the business this fall has been for prompt shipment and immediate consumption. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The market is quiet, as the buying season for this year's delivery is about over and municipalities have not begun advertising their specifications for winter or spring shipment. There is a fair run of small orders for prompt shipment, but no important lettings are reported for the past week. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Merchant Steel.—Very encouraging reports are received from the agricultural implement trade. The manufacturers in this line had their annual convention at St. Louis last week, and it is understood that they expect during the next six months to exceed their former records of production. They are the principal consumers of merchant steel in this territory, and the prosperous conditions which they report are very gratifying to the mills which supply this trade.

Old Material.—While there has been much talk of a better feeling in the trade, the scrap market does not respond with any definite movement in prices. A rolling mill interest has purchased a considerable tonnage of wrought scrap in the past 10 days, and buying of this character usually raises the price 50c. to $1 on any line of material. This particular buyer paid as high as $12.50 per net ton, but obtained all he wanted, and the market has gone off again to about $12. There is a good steady demand for steel scrap, but the supply in the market is ample and has prevented any advance in the price. Rerolling rails are a little weaker, and several lots have been sold recently at $15 per gross ton delivered, although the railroads within the past month have obtained higher prices. Cast scrap is in better demand, but while the price is a little firmer it keeps within a narrow range. Machine shop turnings have also been in demand, and a new steel interest is making inquiries, especially for low phosphorus steel. A strong buying movement on the part of consumers will be necessary to lift the market out of the stagnation that has prevailed the past six months, as stocks are large in the hands of both dealers and consumers, and the railroads also are carrying large stocks which will come out as soon as the market shows any strength. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switch-

THE IRON AND METAL MARKETS

ing charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.00 to 15.50
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	13.50 to 14.00
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.25 to 8.75
Machine shop turnings	7.25 to 7.75
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	14.00 to 14.50
No. 1 cast scrap	12.50 to 13.00
Stove plate and light cast scrap	10.75 to 11.25
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.00 to 9.50

Philadelphia

PHILADELPHIA, PA., November 8, 1910.

While there has been considerably more inquiry for pig iron, largely for early 1911 delivery, actual transactions during the past week show a falling off, as producers are not very anxious to accept forward business at the present market. In view of the better inquiry, however, the trade feels more encouraged as to near future buying. There has been no further curtailment in production, although the blowing out of one or more furnaces is being considered. The finished material market shows little change, makers generally reporting the week's business as light and in a number of cases smaller in volume than in the preceding week. Refined iron bars are lower. Billets continue easy. Consumers, however, are beginning to feel round for prices for first quarter. Nothing of importance has developed in the steel rail situation, but it is believed that some of the large roads will come to a decision in the matter this week. The old material market has been dull, with prices unchanged. Coke is in better inquiry, but most buyers and sellers are at variation as to prices.

Iron Ore.—There has been no movement in this district, both buyers and sellers awaiting developments. Importations of foreign ore at this port during the week ending November 5 aggregated 15,346 tons, valued at $66,505.

Pig Iron.—From the nature of inquiries which have recently developed, it is evident that consumers of the higher grades of foundry iron are beginning to believe that prices have reached bottom. Efforts to get both moderate and fair sized lots for early next year delivery are more pronounced, and orders would no doubt result if such deliveries could be freely had at the quotations made for this year's delivery. Sellers, however, exhibit hesitancy in accepting orders for extended delivery at ruling quotations, as they believe that, while they will not go lower, there is a possibility that a shade better might ultimately be done. Among inquiries for foundry iron recently received, the following are noted: One for 2000 to 4000 tons of No. 2 X, from the local locomotive builder, for first quarter delivery; 1500 tons of No. 2 plain and a small lot of No. 3 foundry from a railroad in this vicinity for first half; 1000 to 2000 tons for first quarter from a stove manufacturer; 1000 tons of No. 2 plain and 1000 tons of No. 3 foundry for this year's delivery, from a machinery builder, together with numerous smaller lots, running up to 500 tons, from various classes of buyers, for both prompt and early 1911 delivery. An Eastern steel mill has also been feeling round for 20,000 tons of basic iron, for delivery during December and the first quarter of next year, which would be bought at a price, but sellers refuse to meet the purchaser's ideas. As far as actual sales are concerned the volume during the week has probably been less than for some weeks. The cast iron pipe makers, who recently purchased quite heavily, have not been buying extensively, although understood to still be in the market for iron for this year's delivery. Several odd lots have, however, been sold to these consumers, including some off basic at $14.70, delivered. Several odd lots of forge iron have been sold to rolling mills. One sale of 600 tons has been made for this year's delivery at $14, furnace, equal to $14.60, delivered at mill. Small sales of both standard and misfit low phosphorus have been made, the standard grade selling at a price equal to $22.50, delivered here. With the exception of the inquiry noted above, the demand for basic iron is at a standstill as the larger buyers will, in the majority of cases, carry iron bought for this year's shipment over into next year. In view of the decreased productive capacity of this grade, sellers have firmed up in their ideas as to prices for next year's delivery, which now range from $15 to $15.25 for first quarter and $15.50 for first half. The following range of prices represents the market for standard brands, delivered in buyers' yards in this vicinity, shipment during the next 60 days and in some instances the first quarter of next year:

Eastern Pennsylvania, No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania, No. 2 plain	15.25 to 15.50
Virginia, No. 2 X foundry	16.00 to 16.25
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.50 to 14.75
Basic	14.75 to 15.00
Standard low phosphorus	22.50

Ferromanganese.—The demand from consumers in this territory is very light. An occasional small lot is sold, but there has been no further inquiry for any material quantity either for prompt or forward delivery. Prices are unchanged at $38.75, Baltimore, for prompt, and $39 for forward deliveries.

Billets.—Current business is confined to small lots for prompt delivery. The larger consumers are showing more interest, however, in supplies for early 1911 shipment, but definite inquiries have not yet developed. For small lots of ordinary rolling billets, $26, delivered in this territory, is still the ruling quotation, although a concession can be had for desirable orders. Makers contend, however, that no reduction would be made for forward deliveries. Forging billets are firm at $28, f.o.b. Eastern mill, the usual extras being added for high carbons and special sizes.

Plates.—Business during the week has been smaller in the aggregate, although the number of orders coming to the mills continues large. Consumers are still buying only for immediate needs, but occasionally a fair size order develops, one for 1000 tons for car work being reported. A number of fair propositions are pending, particularly for ship work, several of which are expected to result in orders in the near future. The inquiry for 2000 tons of plates for gas holder work, reported last week, is still unclosed. It now develops that this is for Pacific Coast delivery, quotations against which are not governed by the usual Pittsburgh basis. For ordinary plates prices show no change, the recent quotation of 1.55c. for carload lots, delivered in this territory, being maintained.

Structural Material.—The general contract for the building of the addition to the Union League, requiring from 900 to 1000 tons of structural shapes, has been awarded to Cramp & Co., who state that the contract for the structural work will not be let for a week. Very little business of any size has been closed recently, although there has been a fair demand for miscellaneous material. Prices appear to be fully maintained, 1.55c., delivered in this territory, being the minimum for plain shapes.

Sheets.—Business has fallen off slightly, but Eastern mills have a fair volume of business on their books and believe the slowing down will be but a temporary one. A moderate inquiry for requirements of consumers over the first half of next year is noted, but sellers are not anxious to take on business of that character. Prices are firm, the following range being named by Eastern makers for early deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—Mills are short of orders for refined iron bars, and lower quotations have been made for the ordinary run of business. In some instances 1.30c. mill, equal to about 1.37c. to 1.42c. delivered in this territory, has been named, and it is rumored that a desirable order might bring further concessions. Consumers are placing small orders, covering immediate needs. A fair run of specifications for steel bars from agricultural implement makers is reported, and prices for steel bars are firm at 1.55c., delivered.

Coke.—A moderate amount of business in furnace coke for early 1911 delivery is reported and more is pending, but a number of sellers refuse to meet buyers' ideas as to prices. One sale of 24,000 tons, for first half, at private terms, is reported. Spot furnace coke is available at $1.55 per net ton at oven, but for forward delivery $1.75 is nearer the market. Few transactions of importance are announced in foundry coke, sales being mostly in small lots. In exceptional cases prompt foundry coke can be had as low as $2 per net ton at oven, but the general market ranges from $2.20 to $2.40. The following range of prices, per net ton, is named for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	$3.85 to $4.10
Foundry coke	4.40 to 4.75
Mountain furnace coke	3.45 to 3.70
Foundry coke	4.00 to 4.35

Old Material.—The market is very quiet. Melters are, for the most part, well supplied, and what little business there is has been largely confined to transactions between

THE IRON AND METAL MARKETS

dealers, applying on previous sales to mills. Strictly No. 1 heavy melting steel ranges from $13.50 to $13.75, delivered, although occasionally material that will pass inspection at some mills can be had under that price. A few sales of No. 1 railroad wrought have been made at $16 to $16.25, delivered. A general waiting policy is being followed, however, both by buyers and sellers, and quotations are necessarily nominal to a large extent. The following range about represents sellers' ideas of the market, delivered in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to 1.35c. per gross ton, although buyers would probably not purchase at those figures, unless in need of material:

No. 1 steel scrap and crops	$13.50 to $13.75
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	19.00 to 19.25
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50*
Old car wheels	13.50 to 14.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.50 to 12.00
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.50 to 9.00
Cast borings	8.50 to 9.00
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cincinnati

CINCINNATI, OHIO, November 9, 1910.—(*By Telegraph.*)

Pig Iron.—The local situation continues to improve. Inquiries are coming in and some fair sized orders are being booked. One agency reports its sales in the first week of November as showing nearly as large a tonnage as the entire month of October. This is an exceptional case, but there is no doubt that consumers are beginning to sit up and take notice. The furnace interests are also getting more independent about taking on business at prevailing figures, and Southern iron especially shows more firmness. Malleable is also engaging attention and several inquiries are being worked on, including one for 2000 tons from the Chicago district. A sale of 1500 tons of malleable to an Indiana concern was made this week, and a number of smaller orders were booked during the past few days, practically all for shipment through the first half of next year from central and northern Ohio. There are an encouraging number of inquiries for foundry iron, ranging from carload lots to 2500 tons, and while no large sales are to be recorded, a considerable tonnage is changing hands, made up principally of small and medium sized orders. Southern foundry No. 2 is quoted for spot shipment at $11, Birmingham, but most interests are now demanding $11.50 for first half delivery, although there are rumors that $11.25 can be done for the first quarter with some furnaces. For either prompt or first half shipment Northern foundry is quoted at $14, Ironton district, but some furnaces absolutely refuse to book business below $14.50 and seem confident they will get this figure or higher within a very short time. The 7500 tons of basic wanted by a local consumer has not yet been contracted for, but the order is expected to be closed soon. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

(*By Mail.*)

Coke.—For shipments to begin January 1 a local agency has made a contract with a Southern furnace to supply it with a year's supply of furnace coke at the rate of 4000 tons per month. Foundry coke is moving fairly well on contracts, but new business is light and is confined practically to carload lots for immediate requirements of the smaller consumers. Some spot shipment furnace coke can still be bought around $1.55 to $1.60 per net ton, at oven, but the contract price for Connellsville, Wise County and Pocahontas fields remains between $1.65 and $1.85. Foundry coke is quotable at an average figure of $2.25 for contracts, but for spot shipments the $2 price for some grades still stands.

Coal.—The car shortage situation is gradually becoming worse, and practically no selling agency is willing to promise delivery of any grade under 30 days from receipt of order, and most of them would be lucky to fill this promise on time. Prices are as follows: Pocahontas lump and egg, $2.25; standard splint lump, $1.85 to $2; run of mines, $1 to $1.25, and slack, 90c. to $1, f.o.b. cars at mines.

Finished Iron and Steel.—Structural material moves very slowly, as there is but little new building going on in this vicinity just now. There are a large number of plans under way, however, and an excellent spring business is anticipated. The retail price for structural material is 1.90c. and on steel bars 1.80c. is quoted, both f.o.b. warehouse.

Old Material.—The improvement reported in other markets is not noticeable here, and local dealers do not look for any brisk business until after the turn of the year. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Cleveland

CLEVELAND, OHIO, November 8, 1910.

Iron Ore.—October lake shipments of ore show a falling off of 1,748,360 tons, as compared with the corresponding month of 1909. The October movement ran 1,396,393 tons behind that of September. The November movement last year was heavy, shipments from November 1 to the close of navigation amounting to 5,418,745 tons. This year the November movement is expected to amount to only about 2,000,000 tons, and practically no ore will be shipped during December. The total lake shipments for the season will be close to 42,000,000 tons, or slightly in excess of the total lake movement of 41,683,873 tons last year. Some of the ore firms will clean up their shipments this week. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—A good volume of inquiry for foundry iron for the remainder of the year, and first half delivery has come from Ohio consumers in the past few days. That the market is becoming more active in other sections is indicated by reports of local furnace interests to the effect that they have received considerable inquiry from Indiana, Michigan, the Pittsburgh district and the East. While the demand is largely for foundry iron, some fair inquiries are pending for basic. Buyers are feeling the market carefully, and some of the business pending a week ago has not yet been closed. Foundry iron inquiries from consumers in this territory are mostly for small lots of 300 or 400 tons or under. An Elyria, Ohio, furnace manufacturer is in the market for 2000 to 3000 tons of foundry iron, 2 to 2.50 per cent. silicon, for first half delivery, and expects to close for this tonnage to-day. Among the larger inquiries is one from a Berea manufacturer for 500 tons of Northern and 200 tons of Southern for first half delivery. The northern Ohio consumer who had an inquiry out last week for 1500 tons of gray forge for December, January and February delivery has bought that tonnage of Northern iron, and is now in the market for 500 tons of Southern gray forge. Foundry iron prices continue weak, although at least one interest is asking a slight advance. Northern foundry iron is being offered at $14, Valley furnace, for No. 2, the price that prevails for delivery through the remainder of the year. For first half, No. 2 is quoted at $14.25 to $14.50, delivered, Cleveland. There is quite an active demand for charcoal iron. For prompt shipment and the remainder of the year, we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	$14.50 to 14.75
Northern foundry, No. 2	14.00 to 14.50
Gray forge	14.00 to 14.25
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.05 to 19.25

Coke.—Local selling agencies are figuring on an inquiry from an Eastern furnace interest for 20,000 tons of coke per month for first half delivery. The market generally is quiet. There is very little inquiry for foundry grades. We quote standard Connellsville furnace coke at $1.55 to $1.60 per net ton, at oven, for spot shipment. For the first half $1.90 is asked, but this price can probably be shaded to $1.85. Connellsville 72-hour foundry coke is held at $2.10 to $2.20 per net ton, at oven, for spot shipment, and $2.25 to $2.30 for delivery through the first half.

Finished Iron and Steel.—One or two agencies report a little improvement in orders, but the market is generally quiet. Specifications on contracts are coming along fairly

THE IRON AND METAL MARKETS

well, but new business is mostly in less than carload lots. The sentiment appears to have improved somewhat and sellers are looking for more activity after election. Steel bars are firm at 1.40c., Pittsburgh; specifications are good, but not much new business is coming out. The demand for plates continues light, but manufacturers in this territory are figuring on work that will require some round tonnages. The only shading in prices is by mills making the smaller sizes. Some of the mills have opened their books for plate and structural tonnage for the first quarter at the current price of 1.40c., and some business has been booked for that delivery. The demand for structural material is quiet. Considerable work is in prospect, but much of this will not be placed before early spring. The contract for the Fowler Building, Detroit, 800 tons, has been given to the McClintic-Marshall Construction Company, Pittsburgh. The American Shipbuilding Company has secured a contract for a 240-ft. passenger boat for Ashley & Dustin of Detroit. The specifications for the plates and shapes for this boat are not yet out. The foundations for the new City Hall Building in Cleveland will require 500 tons of reinforcing bars, for which an inquiry is out. The demand for sheets is only fair; prices on black and galvanized are being quite generally shaded $1 a ton below the regular quotations by the independent mills. The rivet market is firmer. Current quotations on steel rivets are being adhered to for the remainder of the year. The demand for iron bars continues light. We quote common iron bars at 1.30c. to 1.35c., Cleveland.

Old Material.—While the market is quiet there is a slight improvement, as compared with the past few weeks, and a better feeling prevails among the dealers. There is practically no demand from the foundry trade. Dealers are showing less disposition to make sales by shading prices. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.00 to 13.25
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	5.50 to 6.00
Iron and steel turnings and drillings	6.25 to 6.50
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Buffalo

BUFFALO, N. Y., November 8, 1910.

Pig Iron.—A steady volume of small orders has been coming in, and it is understood that a large radiator concern has just placed orders for a portion of its requirements for its Western works, amounting to a considerable tonnage, some of which came to the Buffalo district. An order for 5000 tons of malleable for delivery in this State, was taken at $14.50 for first half—a malleable order of moderate size from a Rhode Island concern was also taken. The total of small orders booked reached a fairly good aggregate, comprised largely of foundry grades. A good deal of iron for general foundry purposes is being figured on for New England points; also inquiries for considerable tonnages of foundry grades from a Western threshing machine company, a large electrical concern and a local car wheel works. Prices are a shade stronger—that is, current schedules are being more closely adhered to, and some furnaces are making a difference in quotations between prompt, first quarter and first half deliveries. Most furnaces, however, continue to quote current schedules to cover first half deliveries. We quote as follows, f.o.b. Buffalo, for current quarter and first half 1911:

No. 1 X foundry	$14.75 to $15.25
No. 2 X foundry	14.25 to 14.75
No. 2 plain	14.00 to 14.25
No. 3 foundry	13.75 to 14.00
Gray forge	13.75 to 14.00
Malleable	14.25 to 14.75
Basic	14.25 to 14.75
Charcoal	17.75 to 18.25

Finished Iron and Steel.—Quiet conditions have prevailed during the week, but specifications on contracts have been coming in more freely than for some time. Indications point to a considerable revival in new buying shortly. There has already been considerable forward contracting in wire and wire products, the feeling being that prices have reached the bottom, and the trend will now be upward. There is also considerable inquiry for sheets and tin mill products. The first shipments of wire and wire nails from the new wire mills of the Jones & Laughlin Steel Company at Aliquippa for this territory are being received this week. The Canadian export trade keeps up well, and the local agency of the leading interest reports some good bookings for bars, plates and shapes during the week. Business in structural lines continues rather light, although some new fall and winter construction is being figured on. Bellew & Merritt, Macedon, N. Y., who have secured the general contract for a section of the Erie Barge Canal work in that vicinity, are receiving bids for 425 tons of steel. Bids are also being received this week for the Oak street warehouse of the H. D. Taylor Company, Buffalo, on revised plans calling for 150 tons, and bids for steel for the Pilgrim Congregational Church, Buffalo, 100 tons. Plans for the Washington Street Market for the city of Buffalo, which have been delayed, will be out for figuring next week. They call for about 700 tons, construction to be begun next spring.

Old Material.—The market has shown a slight improvement, caused principally by the increased demand from outside districts, the demand from Buffalo mills showing a comparatively limited betterment. Local foundries are making increased purchases in a small way, and dealers are adding a little more freely to their stocks. Prices exhibit a strengthening tendency. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.25 to $12.75
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.50 to 15.00
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	18.00 to 18.50
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	10.00 to 10.50
Locomotive grate bars	11.75 to 11.25
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.50 to 6.75
No. 1 busheling scrap	11.25 to 12.00

New York

NEW YORK, November 9, 1910.

Pig Iron.—The volume of business has been smaller in the past week than in any week of October, but there is still a fair total of well distributed buying, in which machinery foundries in New England and eastern New York, as well as New Jersey, have been represented. Sellers take a rather more hopeful view of the situation, partly because the further cutting down of pig iron production that is promised will stop accumulations of stock, and partly because better railroad buying has a sentimental effect on all lines. Radiator and cast iron pipe foundries have satisfied their wants for the present and no notably large lots have been taken in the past week by other interests. In fact some inquiries that seemed promising have been withdrawn. At the same time furnaces are not hurrying to quote on inquiries for the first quarter, and particularly the first half of 1911, most of them having a fair amount of their product for the next three months already placed. Furthermore, there is nothing in present prices to prompt a scramble for business. Valve manufacturers in Connecticut, stove founders in New York State and jobbing foundries in New Jersey have bought moderate lots. Prices for basic iron for 1911 have been under discussion in eastern Pennsylvania without any agreement between sellers and buyers. Furnaces are disposed to ask 50c. to 75c. more than the low figure, $14.50, touched five or six weeks ago. We continue to quote as follows, for tidewater deliveries: Northern No. 2 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.50; No. 2 plain, $15.25; Southern No. 1 foundry, $15.50 to $16; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—How much of the late dullness in the iron and steel business has actually been due to the approaching elections will shortly be revealed. Certain it is that the last week has been especially quiet in all lines of finished iron and steel, whatever may have been its cause; at the same time there appears to be a very pronounced feeling that an improvement of conditions is imminent and no weakness in prices is evident. There is no change to report in the situation in plates, steel bars or bar iron. Very little new business is being placed, but the bar mills are fairly active on old contracts. For bar iron there appears to be a little more inquiry for contracts for future delivery. The past week has been particularly dull in the structural lines and a very small tonnage was closed. Milliken Brothers took 300 tons for an apartment house at 110th street and Seventh avenue, in this city. The New York Central transfer bridge at Sixty-ninth street, 350 tons, it is also understood, has been placed. New inquiries in the market for bridge material are as follows: For the Baltimore & Ohio, 2000 tons for grade crossing elimination work in Chicago, 200 tons for the Virginian Railway, and 200 tons for the Chicago, Milwaukee & St. Paul. Bids have also been asked for 700 tons for a city bridge in Seattle. The only impor-

THE IRON AND METAL MARKETS

tant proposition still to be heard from in New York City are the post office at the Pennsylvania Station, the Woolworth Building and the Washington Irving High School. Prices remain unchanged: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.45c. to 1.50c.

Steel Rails.—Sales of the week include 1500 tons by the Carnegie Steel Company and 1600 tons by a western Pennsylvania mill to the Lexington & Eastern Railway Company. The Norfolk & Western tonnage for 1911, recently under consideration, is reported at 30,000 tons, which will probably be divided between two Pennsylvania mills.

Ferroalloys.—Ferromanganese is selling well, and transactions have been made in this market at $39 for delivery over the first half. Ferrosilicon is in fair demand and sellers here are asking $56.50, Pittsburgh.

Cast Iron Pipe.—The most important public letting in this vicinity now coming up is for 1800 tons of water pipe at Hartford, Conn., on which bids will be opened November 21. Rumors are current that New York City will shortly ask bids on a large quantity of water pipe, but as yet nothing definite is known as to time or quantity. Inquiries are not so numerous as they have been and current business in small orders is diminishing. Inquiries for New England requirements now seem to have practically covered what may be expected from that section. Very low prices have been made on recent lettings. The lowest bid on the Providence letting, 800 tons, opened November 2, was $21.40, delivered, for 16-in. and $22.10 for 6-in., made by a company in eastern Pennsylvania. The bids opened November 3 on about 4000 tons of cast iron water pipe and special castings by the New York Department of Water Supply, Gas and Electricity, divided in three sections, ranged on section 1 from $21.34 to $22.40 on 1530 tons of pipe, $35.65 to $46.50 on 150 tons of specials and $38.65 to $46 on 60 tons of valve boxes; on section 2 from $21.90 to $23.40 on 1960 tons of pipe, $38.80 to $48.50 on 300 tons of specials and $42 to $47 on 170 tons of valve boxes; on section 3 from $22 to $24.15 on 35 tons of pipe, $45.50 to $50 on 110 tons of specials and $38.90 to $50 on 35 tons of valve boxes. Carload lots of 6-in. are quoted at $22 per net ton, tidewater.

Old Material.—The market is exceedingly quiet, even the foundries doing very little buying. Stove plate shows a little better movement than other grades of cast scrap. Dealers' quotations per gross ton, New York and vicinity, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	11.00 to 11.50
Heavy melting steel scrap	11.00 to 11.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.50 to 13.00
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.50 to 6.00
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	10.00 to 10.50
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	12.00 to 12.50
Stove plate	10.00 to 10.50
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

St. Louis

ST. LOUIS, November 7, 1910.

The car works and steel foundries report a falling off in their business. This is really the only serious discordant note. On the whole the outlook in the iron trade is regarded as encouraging. Many of the leading merchants are inclined to favor a reasonable advance in railroad rates, predicted on the belief that the railroads would be enabled to resume liberal buying of supplies and improve their equipment and roadbed. It would lead also to extensions of their lines and develop new lines.

Coke.—The dullness is somewhat more pronounced. As customary when trade is quiet, the tone of the market is weaker. None of the leading sellers is in receipt of inquiries of consequence and no sales of importance are reported.

Pig Iron.—There is a somewhat larger inquiry than has been the case for some time. Buyers and sellers, however, continue, for the majority of instances, apart in their views, although the former are not as sanguine in regard to lower prices prevailing in the near future as they were some weeks since. A leading house reports sale of 1000 tons Southern No. 2 foundry to an Illinois stove manufacturer, and the same tonnage to another Illinois stove manufacturer, both lots for shipment over the first half. Another office reports sales of Southern No. 2 foundry, aggregating 1000 tons, for various deliveries, principally first half. A third house mentions inquiries for 500 tons Southern No. 2 foundry, shipment over the first half, and 450 tons from various parties for miscellaneous kinds of iron. There is no change in prices.

Old Material.—While there is an improvement in the inquiry for scrap iron and steel and a stronger undertone to the market, there is very little doing as regards actual business. It is, however, the opinion of the leading dealers that consumers' requirements will soon force some buying. The following railroad lists were offered last week: Chicago & Eastern Illinois, 400 tons; Missouri Pacific, 800 tons; Wabash, 300 to 400 tons. With the exception of relaying rails, which are 50c. per ton higher, we note no change in prices, though they are somewhat firmer.

Birmingham

BIRMINGHAM, ALA., November 7, 1910.

Pig Iron.—Considerably more interest is being manifested in deliveries after January 1 than even at the time of last report, but market conditions have not been affected to an appreciable extent, owing to the difference in opinion of the parties concerned in the matter of price. The tonnage booked during the week is probably no more satisfactory than for the week previous and is in all cases for prompt shipment, with an unusually large territory covered. So far no lower price than a basis of $11, Birmingham, for prompt shipments has been heard of and $11.50 for deliveries after the first of next year is being adhered to strictly by all interests in making quotations. A number of offers of $11 for round tonnages to cover the first quarter have been made without success, and it is not believed than an opportunity was offered by the buying interests for trading at a price 25c. per ton higher. Such a price would no doubt be accepted by certain large producers for shipments to cover the entire first half, but the idea of $11 for shipments within that time has apparently become so general that quotations on an $11.25 per ton basis would not result in heavy buying until requirements are more urgent. Stock reports from this district for November 1 do not show a material decrease during October. The actual consumption during the latter part of the month was considerably reduced and still further reductions have been made since November 1. The most significant curtailments in the melt have been made by the manufacturers of cast iron pipe, but normal activity in that industry is reasonably expected immediately after the beginning of the new year. It is noted that no inquiries for low grade iron have been withdrawn and that the output of such grades is being moved very readily, with practically all shipments to pipe foundries.

Cast Iron Pipe.—It is understood that the tonnage on the order books of producers was very materially reduced during October, and that the small orders now being placed are of but little consideration, when compared with the present rate of production. The movement to the North and Northwest has decreased to a very appreciable extent during the past fortnight, and all contracts expected from such territory are being held in abeyance. There have also been one or more postponements of lettings in the South pending more favorable weather conditions for the proposed extensions. A new level for prices of small lots has recently been established, with the aggregate tonnage very limited, but all local concerns are known not to have been competitors for the business. It is not believed that present prices would be acceptable to certain large producers, even for round tonnage contracts, consequently latest transactions are not considered a criterion of market conditions. We revise last quotations published by a reduction of $1 per ton, and quote nominally as follows for water pipe, f.o.b. cars here: 4 to 6 in., $21; 8 to 12 in., $20; over 12 in., average $19, with $1 per ton extra for gas pipe. These prices are no doubt subject to material shading by certain producers.

Old Material.—No reports of an encouraging nature are yet made by local dealers; in fact, the market is practically without any feature of interest. The accumulation in this district has been materially reduced, but the reduction is due to the failure of dealers to replenish stocks rather than to a heavy movement to consumers. Dealers quote prices about as follows per gross ton, f.o.b. cars, here, although all these prices are nominal only:

Old iron axles	$15.00 to $15.50
Old iron rails	13.00 to 13.50
Old steel axles	14.50 to 15.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	8.00 to 8.50
No. 2 country	7.50 to 8.00
No. 1 machinery	9.50 to 10.00
No. 1 steel	11.50 to 12.00
Tram car wheels	9.50 to 10.00
Standard car wheels	10.50 to 11.00
Light cast and stove plate	8.00 to 8.50

THE IRON AND METAL MARKETS

Metal Market

NEW YORK, November 9, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Nov.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
3	12.87½	12.75	36.30	4.40	4.27½	5.95	5.80
4	12.87½	12.75	36.20	4.40	4.30	5.95	5.80
5	12.87½	12.75	....	4.40	4.30	5.95	5.80
7	13.00	12.87½	36.40	4.40	4.30	5.95	5.80
9	13.00	12.87½	36.25	4.40	4.30	5.95	5.80

Copper has advanced ⅛c. as the result of the better feeling caused by the October report of production and stocks. The price of pig tin has eased off slightly. The recent advance in spelter is being well maintained. Lead is firmer in the West.

Copper.—While the report of the Copper Producers' Association showed an increase in production, when a decrease was expected, the deliveries during the month were heavy enough to offset this disappointment and the trade on the whole has accepted the report favorably. An indication of the improved feeling caused by the report is shown in the fact that the large sellers of copper advanced their quotations ⅛c. on Monday and the few outside lots that were offered at less than that price were soon taken up by anxious consumers. There has been good steady buying all the week, but the demand is not particularly heavy. Electrolytic copper is now held firmly at 12.87½c. and lake is selling at 13c. The exports of copper so far this month have not been very heavy, amounting in all to 5050 tons. The London market has not taken the October statistics as favorably as sellers on this side of the water and there has been a noticeable decline in the price there. The London market was boosted somewhat, however, previous to the report on the supposition that a decrease in production would be shown. Large copper selling interests now announce that they had not expected a decrease in October, but they declare that the report to be issued in December will show a noticeable curtailment. The London market closed to-day with spot copper selling at £57 17s. 6d. and futures at £58 16s. 3d. The sales amounted to 200 tons of spot and 1100 tons of futures. The market closed steady.

Waterbury Average.—The Waterbury average for October was 12.87½c. The average price of lake copper in New York during the month was 12.84¾c., and the average price of electrolytic was 12.71¼c.

Pig Tin.—As there was no selling on either Saturday or Tuesday, the week's trading has been light. Stocks are more plentiful in this country, but as the major part of the available tin is in the hands of a few people the holders show no disposition to take business at lower prices than prevailed a week ago. The market here is now below the cost of import, which is a clear indication that the corner heretofore controlling spot supplies of tin has lost its grip to some extent. The market began to fall off on the afternoon of November 2, and when the market opened November 3 tin was selling ½c. cheaper than the day before. Since that time quotations have strengthened only 10 points, and, as consumers show no anxiety to buy, no great advance is looked for within the next few days. The arrivals of tin so far this month have been 1380 tons, and there are 965 tons afloat. In New York this afternoon pig tin was sold for 36.25c. The London market closed with spot tin selling at £165 15s. and futures at £166 5s. The sales amounted to 170 tons of spot and 300 tons of futures. The market closed firm.

Tin Plates.—There is not a very active demand for tin plates, but the price for 100-lb. coke plates is maintained at $3.84, New York.

Lead.—Lead has strengthened in the West, and the call for the metal here is a little better than it was a week ago. Lead is now costing 4.30c., St. Louis, and the price here continues at 4.40c., according to the quotations made by the leading interest, though outside sellers are asking more. The usual quotation of the independent sellers is 4.45c. rive the most benefit.

Spelter.—The advance made last week is being well maintained, and the interests that control the supplies are not particularly anxious to sell even at the higher quotation. There are reports of further reductions in the smelting output of the metal caused by the closing of plants in the Kansas gas district. Prime Western spelter in this market is costing 5.95c., and in St. Louis it is being held at around 5.80c.

Antimony.—Buyers continue to neglect antimony. Cookson's is quoted at 8.15c.; Hallett's, 7.75c.; Chinese brands, 7.40c. to 7.55c., and the Hungarian grades from 7.12½c. up.

Old Metals.—The market is strong, but dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.50 to 12.75
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, November 8.—There is a fairly steady demand for copper and the Chicago market is about ⅛c. stronger. Spelter continues to advance. Lead is quiet. We quote Chicago prices as follows: Casting copper, 13c.; lake, 13¼c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c., higher; pig tin, carloads, 37c.; small lots, 39c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb., higher; spelter, 5.90c. to 5.95c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.75, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12¾c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11¼c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4¼c.; pewter No. 1, 25½c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, November 7.—Lead is quiet at 4.27½c.; spelter is higher and firm at 5.75c., both East St. Louis. Zinc ore is active and higher at $45 per ton, Joplin base. The strength of the ore market is due to a much improved demand for spelter and to a reported concerted effort all along the line to advance prices. A further advance is predicted. Tin is quoted at 36.65c. per pound; antimony (Cookson's), 8.47½c.; lake copper, 13.35c.; electrolytic, 13.22½c., all at St. Louis. The demand for finished metals for the past week averaged fair, with some improvement in railroad buying.

Iron and Industrial Stocks

NEW YORK, November 9, 1910.

While the volume of business in stocks has not been large, pending the approach of election, some iron and industrial stocks have made decided gains since last report, notably United States Steel common, International Harvester common, Republic common and Can preferred. The range of prices on active iron and industrial stocks from Wednesday of last week to Monday of this week was as follows:

Allis-Chalm., com.	9¾	Railway Spr., com.	35½ - 36
Allis-Chalm., pref.	33 - 34¼	Railway Spr., pref.	96
Beth. Steel, com.	31 - 32½	Republic, com.	33⅜ - 36
Beth. Steel, pref.	61⅜ - 61½	Republic, pref.	98 - 99½
Can, com.	9⅞ - 10⅝	Sloss, com.	51⅜ - 53
Can, pref.	75½ - 78¼	Pipe, com.	16⅛ - 17½
Car & Fdry, com.	54 - 56	Pipe, pref.	56
Car & Fdry, pref.	114 - 115	U. S. Steel, com.	78½ - 81⅝
Steel Foundries	46½ - 47¾	U. S. Steel, pref.	116⅞-118⅛
Colorado Fuel	34½ - 35¾	Westinghouse Elec.	73¼ - 74¼
General Electric	154½-155½	Am. Ship, com.	79¾ - 80
Gr. N. ore cert.	59¾ - 61	Am. Ship, pref.	110½
Int. Harv., com.	110½-115	Chi. Pneu. Tool	40½ - 41
Int. Harv., pref.	123 -123½	Cambria Steel	43½ - 44
Int. Pump, com.	43 - 45⅜	Lake Sup. Corp.	25½ - 26
Int. Pump, pref.	82 - 83¾	Pa. Steel, pref.	105¾
Locomotive, com.	39¾ - 41	Warwick	11
Locomotive, pref.	106½	Crucible St., com.	13 - 13⅜
Pressed St., com.	34½ - 35½	Crucible St., pref.	78¼ - 79¾
Pressed St., pref.	97		

The Otis Steel Company's Increased Earnings

The London *Statist* of October 29 refers to a recent rise in the price of ordinary shares of the Otis Steel Company, Ltd., Cleveland, Ohio. In three days the London quotation advanced from 81½ to 92½, as the result of an increase in the dividend from 5 to 6 per cent. The fiscal year ending June 30 was next to the best year in earnings. "Trading profits" are reported at £150,232 on a total capital of £610,123. For depreciation £25,000 was written off, £19,800 was placed to the credit of the service fund and £25,000 was added to the reserve fund. In addition £20,000 was set aside to form the nucleus of a dividend equalization fund. The profit of over £150,000 in the year ending June 30, 1910, compares with £93,519 in 1909, £76,497 in 1908, £158,444 in 1907 and £136,236 in 1906. The capital of the company now consists of £280,123 of 5 per cent. debenture stock and £330,000 consolidated ordinary stock.

Trade Publications

Pumping Machinery.—The Heller-Aller Company, Napoleon, Ohio. Catalogue No. 26. Lists an extensive line of ball bearing wind engines, galvanized steel towers, suburban water pumping outfits, flag and bell towers, pneumatic pressure tank water systems, gasoline engines, hydraulic regulators, pressure house tanks, pump cylinders, hydrants, tank valves and floats, tanks of galvanized steel, pine and cypress, cisterns, tank heaters and feed cookers.

Air Purification System.—Thomas & Smith, 116 North Carpenter street, Chicago, Ill. Brochure. Presents the advantages of the Thomas Acme air purifying and cooling system. The various features of the system are described, and there are engravings showing both installations of the apparatus and buildings where it has been installed.

Drag Line Excavators.—The Bucyrus Company, South Milwaukee, Wis. Catalogue. Concerned with the Heyworth-Newman drag line excavators, which are built in several sizes for handling buckets ranging from 1½ to 5 cu. yd. capacity, and with booms of any length up to 100 ft.

Knife Grinding Machinery.—Samuel C. Rogers & Co., 10 Lock street, Buffalo, N. Y. Circulars. Refer to the various sizes of improved Buffalo automatic knife grinders and saw sharpeners. Three sizes of the former are built, and a maximum size of knife ground is 120 in. long. The saw sharpeners are made in three sizes to handle circular saws as large as 72 in. in diameter, and the line also includes band saw sharpeners for blades 10 in. wide.

Electrical Machinery and Appliances.—Fort Wayne Electric Works, Fort Wayne, Ind. Instruction book and three bulletins. Instruction book No. 3043 deals with installing and operating the type K3 single phase watt-hour meters. Tables of dimensions and wiring diagrams are included. Bulletin No. 1121 describes and illustrates the Northern type B direct current generator, which is built in sizes ranging from 1 to 75 kw. No. 1124 is concerned with portable calibrators for alternating current watt-hour meters. This calibrator is designed to supresede the ordinary method of calibrating meters with standard indicating instruments and a stop watch. No. 1125 refers to the type K3 single phase induction watt-hour meter, and describes the various features of it at length.

Textile Machinery.—The Mason Machine Works, Taunton, Mass. Two illustrated catalogues. The first is concerned with a line of ring spinning machinery for cotton mills, and the second refers to the carding machinery of this company, and like the other describes them completely.

Sheet Metal Stamping.—Otto Konigslow Mfg. Company, Cleveland, Ohio. Loose leaf portfolio. Contains a number of photographs of special sheet metal stampings and automobile parts made by this company and a number of interior views of the plant.

Fuel Economizers.—The Green Fuel Economizer Company, Matteawan, N. Y. Bulletin No. 132, entitled "Power for Cement Mills from Waste Heat." Presents information regarding the amount of fuel used in the various cement making processes, and discusses several means of cutting down the heat wasted up the kiln and boiler stacks or radiated by the hot clinker. These different methods are illustrated and a number of layouts of actual installations in cement mills are shown.

Double Spindle Lathes.—J. J. McCabe, 30 Church street, New York City. Illustrated loose leaf circular. Refers to a double spindle, 26-48-in. swing lathe in operation in various shops. This lathe combines in one tool a triple gear 48-in. lathe for big work, and a handy back geared 26-in. lathe for small work. Two separate sets of head and tail stocks accommodate the different diameters of work.

Quick Change Miller and Gear Hobber.—The Adams Company, Dubuque, Iowa. Two loose leaf circulars. No. 701 illustrates and describes the No. 0 Farwell quick change miller, so-called because the fixtures are clamped to the table without using wrenches and the cutter brought to position very quickly. No. 811 gives general description and specifications for the Farwell No. 3 gear hobber, an illustrated description of which appeared in *The Iron Age* September 8, 1910.

Steam Traps.—George M. Newhall Engineering Company 136 South Fourth street, Philadelphia, Pa. Circular. Pertains to the Vance steam trap, which is declared to have an exceptionally large discharge valve area and to act positively under all circumstances. The construction and operation of the trap are described, and a sectional view shows the various parts.

Electric Construction Supplies.—Illinois Malleable Iron Company, 1801 Diversey Boulevard, Chicago, Ill. Catalogue. Deals with a number of electrical construction supplies for interior and outdoor, overhead and underground work.

The New York State Steel Company blew out its furnace at Buffalo, N. Y., October 14. It will be relined.

The Pittsburgh Metal Products Company

The Pittsburgh Metal Products Company, a corporation with a Delaware charter, has recently opened offices at 1639 Oliver Building, Pittsburgh, Pa. The company has been organized for the purpose of thoroughly exploiting products made from American ingot iron. It has been licensed by the International Metal Products Company, Middletown, Ohio, to take over the manufacture and sale of genuine American ingot iron products, such as plates from No. 9 gauge to 11-16 in. thick, inclusive, up to 84 in. wide by 25 ft. long; also lap welded boiler tubes, welded pipe, tubing, casing, line pipe and certain classifications of sheets. Genuine American ingot iron, 99.94 per cent. pure, is a material which has been commanding the attention of the consumers of iron and steel products for the past two or three years, because of its properties for resisting rust, acids, sulphur, and other corrosive agents.

The Pittsburgh Metal Products Company furnishes literature giving descriptive information pertaining to the superior rust resisting properties of American ingot iron, among which is a blue print showing the results of certain tests, particularly illustrating, in a unique way, the superiority of this material for the resistance of rust, acids, &c. Harry E. Sheldon is president and W. Lester Walker is secretary and treasurer.

Cincinnati Machinery Trade Activity

Secretary Manley, of the Cincinnati Metal Trades Association, has made public his last quarterly report. Taking June 15, 1907, as standard, association plants in this territory are working up to 91 per cent. Below is given a tabulated list of reports issued from that date to September 15, 1910:

	Per cent.		Per cent.
June 15, 1907	100	March 15, 1909	62
September 15, 1907	97	June 15, 1909	65
December 15, 1907	85	September 15, 1909	72
March 15, 1908	67	December 15, 1909	83
June 15, 1908	56	March 15, 1910	89
September 15, 1908	53	June 15, 1910	92
December 15, 1908	56	September 15, 1910	91

It will be seen that the last report shows a falling off of 1 per cent. over the previous one, but indications are that this will more than be made up before the December report is issued.

Republic General Offices to Go to Youngstown.—It has been definitely decided to remove the general offices of the Republic Iron & Steel Company, now located on the seventeenth and eighteenth floors of the Henry W. Oliver Building, Pittsburgh, to Youngstown, Ohio. The company will begin at an early date the erection of a modern office building in Youngstown near its steel plant. It is to be seven or eight stories high. As soon as the building is finished it will be occupied for the purpose above named. The move will likely be made July 1 next year, and the company will maintain a district sales office in Pittsburgh after the general offices are taken to Youngstown.

The population of Youngstown, Ohio, is 79,066, an increase of 34,181, or 76.2 per cent. The population of El Paso, Texas, is 39,279, an increase of 23,373, or 146.9 per cent.

The annual meeting and banquet of the Cleveland Employers' Association will be held at the Hollenden Hotel, Cleveland, Ohio, on the evening of November 29.

The Malleable Iron Fittings Company, Branford, Conn., is installing an additional modified Bessemer converter.

Iron and Steel Analysis

An Important Error in Sulphur Tests

BY GEORGE AUCHY.*

This error is sulphuretted hydrogen loss—not from diffusion out of solution, but from dissociation—in dissolving the cadmium sulphide before titration in the almost universally used volumetric evolution method. The remedy is in the adoption of the seldom used Wood's modification (but with a special precaution not hitherto proposed) described in Blair's "Chemical Analysis of Iron," which consists in filtering the cadmium sulphide before solution and titration, whereby this loss is avoided, as in that case the cadmium sulphide adheres to the filter paper and does not at once diffuse and dissolve, and in titrating, therefore, the iodine may from the start be kept continuously in excess (the special precaution above referred to), shaking the flask after each addition until the blue begins to change to purple, and thus allowing of no chance for sulphuretted hydrogen dissociation.

Heretofore it has not been suspected that there was loss of sulphuretted hydrogen in dissolving and titrating as usual, and the purpose of Wood's modification is not to prevent such loss, but to "avoid the error that the absorbed hydrocarbon gases may produce"—a plus error, of course, and a very important one also. From the earliest use of the Elliot method for sulphur and its modern modifications the fact that sulphuretted hydrogen in very dilute solution promptly dissociates to a certain extent is a fact that has entirely escaped notice, and what has helped to blind analysts to this error has been the partly compensating error from dissolved hydrocarbons that Wood avoids by filtering—an error equivalent to from 0.01 to 0.03 per cent. sulphur when the solution is cold. That Wood did not discover the sulphuretted hydrogen error also may be ascribed to the fact that he did not titrate promptly and did not take pains to keep the titration abreast of the solution of the cadmium sulphide. As fast as the sulphuretted hydrogen is formed it must find the iodine immediately at hand to decompose it. Otherwise it immediately decomposes of its own accord—to some extent at least—and if the cadmium sulphide in Wood's modification be entirely dissolved before titration the result will inevitably be just as low as by the usual process. It will, in fact, be much lower, because here there will be no dissolved hydrocarbon error to boost it up.

A Known Fact Ascribed to a Wrong Cause

That the usual volumetric evolution method gives results much lower than aqua regia method results has been known to the writer for many years, but has always been ascribed by him to a wrong cause—sulphuretted hydrocarbon loss in dissolving the drillings instead of sulphuretted hydrogen loss in dissolving the cadmium sulphide. Beginning in 1901, he called the attention of the trade to this error in a number of articles descriptive of different experiences on this point, and published in the *Journal* of the American Chemical Society, *The Iron Age*† and the *Chemical Engineer*. Of these various articles, the one that lingers the most dolefully in his memory is one showing that even in wrought irons this sulphuretted hydrocarbon error (as he then considered it) occurs. Not that there was any mistake in the facts he brought up, but his easy and ready assumption that his low results by evolution were due to sulphuretted hydrocarbon loss, now that he is aware of the real cause—sulphuretted hydrogen loss in titrating—seems very foolish. However, nobody believed either his facts or his theories at the time; although the belief in this same loss in the case of pig irons (based on the classical experiments of Professor Phillips in 1895) was universal.

Later on it transpired that abroad they had also been having experiences with the evolution method for steel, and these experiences, like the writer, they ascribed to sulphuretted hydrocarbon loss, the same as in pig irons, and the use of the red-hot porcelain tube recommended by Phillips for pig iron became quite general abroad for steels also. Finally, in the seventh edition of "Blair's Chemical Analysis of Iron," the statement, "the evolution method in steels as in pig irons sometimes gives results a little too low," indicates that at last this country also is—although very guardedly—coming to this belief, a belief that the writer so ignominiously failed to get it to accept years ago.

A Question as to Evolution Methods for Steel

The interesting question now arises: Is there after all any sulphuretted hydrocarbon loss in evolution methods for steel? Loss undoubtedly there is in the volumetric evolution method, as just explained, and not a slight one, but a great one, but as the writer was mistaken in his theory of the cause of the loss, so also possibly may be everybody else, and our German and English brethren's red-hot tube may perhaps be in steel analysis an utter futility. But the writer must hasten to confess that he has not proved that a small part of the difference he found years ago between evolution and aqua regia results was not due to sulphuretted hydrocarbon loss—there may have been a little of that also in connection with the main loss—the sulphuretted hydrogen loss. He has been deterred from going into this point by the experience of Professor Levy, described in the *Journal* of the Iron and Steel Institute for 1908, an experience which shows that even in white pig iron the sulphuretted hydrocarbon loss is apparently rare (he was unable to find any cases of it at all), certainly not inevitable, and one might therefore make very many tests in steels before finding a case.

But a significant point in favor of the opinion that there is such loss in steel is, it must be admitted, the declaration of Blair to that effect. For Blair's evolution method is a gravimetric-volumetric one; the sulphuretted hydrogen error does not appear therefore in it, and any low results obtained by that method could very properly be attributed to sulphuretted hydrocarbon loss, although not necessarily so.

Appended are a few results showing the gain in Wood's modification results over the usual volumetric evolution method results.

No.	Usual method, sulphur, per cent.	Wood's modification, sulphur, per cent.
18,615	0.068	0.090
18,491	0.041	0.051
18,502	0.027	0.036
18,373	0.057	0.074
18,375	0.057	0.066
18,598	0.057	0.076
18,616	0.056	0.064
18,596	0.050	0.074
18,719	0.081	0.094
18,734	0.073	0.086
18,733	0.068	0.084
18,719	0.081	0.092

But the following show that the compensating hydrocarbon error of Wood in the usual process will on occasion bring the usual method result up to the Wood result:

18,499	0.046	0.049
18,500	0.045	0.044
18,402	0.070	0.068

This compensating hydrocarbon error may range from 0.010 to 0.030 per cent. sulphur, according to a few experiments made by the writer, with pains taken to titrate perfectly cold (heat enormously increases the error). The use of a correction is therefore impossible. Equally futile is standardization by a standard steel.

It will, of course, be understood that the "Wood's modification," referred to in the above table, includes the writer's precaution in titrating, without which the original modification is useless.

* Laboratory of Henry Disston & Sons, Inc., Tacony, Philadelphia.

† December 10, 1904.

The Machinery Markets

Dullness prevailed during the week in some machinery selling centers because of the election, while in other localities the election had no effect on the market whatever. In New York and Chicago the trade has been marking time during the last week and nothing of consequence has come into those markets with the exception of scattered railroad orders. In Pittsburgh there is an increased demand for second-hand and rebuilt machinery and conveying equipment is selling better than some other classes of mechanical apparatus. In Cincinnati the Buffalo & Susquehanna Railroad Company has placed some orders and inquiries indicate that good business will shortly ensue from other sources in that market. In Cleveland the Lake Shore Railroad has inquiries out for a number of motors, but beyond that there is a light volume of scattered inquiries largely for machine tools. More cheerful reports come from Cincinnati where a number of new enterprises are supporting the market with purchases, and there is a steady run of miscellaneous inquiries from the railroads. There is a renewed demand from the South for machinery of all kinds and boilers and other power accessories are being asked for in good quantities. New enterprises have resulted in good purchasing in the Southwest, where the outlook for the future is very encouraging. A similar condition exists in the Northwest, and a feature of the trade there is a good call for woodworking machinery. Manufacturing expansion in the farther Central West is bringing in a large volume of inquiries and some good trading is promised in the market in the near future.

New York

NEW YORK, November 9, 1910.

Because of the intervening holiday of yesterday the week has been a short one in the New York market and there are no developments of any consequence to report. Orders are still drifting in from the railroads mentioned in last week's review, but very little business has been done in other directions. A few inquiries have come into the market and some trading has been done in second-hand machine tools. Prospective buyers of machinery equipment are showing a great deal of hesitancy at this time, but it is hoped that with election excitement over they will take hold with renewed confidence. It is generally conceded that many manufacturers who sent out rather ambitious lists of requirements more than a month ago have compromised by closing out for enough equipment to tide them over, and in consequence have reduced their requirements materially. Many of them have gone so far as to purchase second-hand machinery in place of new equipment their inquiries called for. A general survey of the trade brings out the fact that inquiries on the whole are numerous, and it only requires a more general feeling of confidence to bring about a buying movement of some consequence. Machine tool builders are fairly busy and many of them are still behind in their orders, but recent cancellations on the part of dealers and other customers has resulted in cutting down the delivery terms on many makes of machine tools. In other words, some machine tool builders who were as much as four months behind on lathe and shaper orders for weeks ago are now only 30 days behind because of the cancellations that have come in of late. This is not true of all manufacturers, as makers of some classes of hydraulic machinery are ordered up several weeks ahead, and have all the work they can take care of with their plants running on full time. Manufacturers of electric motors are also decidedly busy, and there is a good call for small power units, such as are installed in small jewelry manufacturing plants, apartment houses and office buildings.

Ford, Bacon & Davis, consulting engineers, 115 Broadway, New York, are preparing plans for a power house to be built at Hurricane, W. Va., for the Clinchfield Coal Corporation, Spartanburg, S. C. The plant will provide electric lighting and power facilities for the mines of the company near Dante, Va., and adjacent towns. In addition to the power house four substations will be erected, and a contract has been closed with the Westinghouse Electric & Mfg. Company for all the electrical apparatus, which will include two 1000-kw., 6600-volt turbines and 300-kw., 250-volt motor generator sets. Contracts for boilers and other auxiliaries, together with power accessories, will be let at an early date, and the plant will be ready for operation about April 1. This enterprise is part of the Clinchfield Company's plan for extensive developments of its coal properties along the Carolina, Clinchfield & Ohio Railway. About $200,000 will be spent, and the company recently arranged to spend $50,000 to lay 8 miles of iron pipe for conveying water to its mines from the Clinch River.

The Maximilian Machine & Tool Company, Buffalo, N. Y., will erect a factory building at Woodstock, Ont., for the manufacture of the Maximilian pneumatic tools. The company has a capital stock of $100,000 and has secured 2 acres of land upon which the factory will be erected. Equipment required for the plant will consist of turret lathe machines, handy lathes with turrets, plain lathes, lathes to finish cylinders and pistons, milling machines, universal grinders, internal grinders, tool grinders, drill presses, bench drills, presses, furnaces for handling valves, small tools, drills, reamers, gauges, files, power saws, air compressors, anvils, blacksmith supplies, &c.

The Alonzo H. Magee Company, with New York offices at 106-108 Beekman street, has completed arrangements for manufacturing its product in a plant recently acquired at Carlstadt, N. J. The company recently purchased several buildings there on a plot of land 200 x 500 ft., where it will continue to manufacture air valves, gauges, gaskets, hot water thermometers and other specialties.

James Stewart & Co., 30 Church street, New York, have been awarded the entire contract for the construction of a 3000-barrel cement plant to be built at Hudson, N. Y., for the Knickerbocker Portland Cement Company. James Stewart & Co. will buy all the machinery and other equipment in addition to supervising the erection of the factory building.

The Reddin Iron Works, Syracuse, N. Y., has let contract for construction of a one-story foundry addition to its plant on Marcellus street.

The Garlock Packing Company has acquired the factory premises formerly occupied by the Ontario Tack Company on Queen street, North Hamilton, Ont., and is enlarging and equipping the plant for its own use.

The Rennselaer Valve Company has been incorporated at Troy, N. Y., with a capital stock of $500,000, to manufacture valves, hydrants, brass castings and foundry products. The incorporators are Messrs. Rowe and Irving, Troy, N. Y., and Thos. Breslin, Waterford, N. Y.

The State of New York will erect a steel lift bridge over the Erie Canal at Franklin street, Syracuse, at an estimated cost of $43,000. Bids are being received by Frank C. Stephens, Superintendent of Public Works, Capitol Building, Albany.

Chicago

CHICAGO, ILL., November 7, 1910.

The approach of a national election usually causes a cessation of activity in the machine tool trade, especially when the issues involved have any direct bearing on business conditions. For several months the machine tool trade in the West has been depressed by uncertainty in the minds of many manufacturers, and the volume of orders has been considerably short of the average sales in this territory in good times. There has been some complaint also of slow collections and conditions on the whole have been far from satisfactory from the standpoint of the dealers. It is generally understood, however, that a turning point has been reached in business conditions, and that a better market for machinery may be expected from now on.

Inquiries from the general trade have been improving the past week or two, and there are signs of returning confidence among manufacturers in the West. While the railroads use only a small percentage of the product of the machine tool industry, the policy of the railroads is a very important factor in the condition of the market. The reports that the railroads have obtained a settlement on political questions which are of paramount importance to them have therefore proved very encouraging among machinery men. As soon as the rail-

THE MACHINERY MARKETS

roads begin placing liberal orders for rails and equipment, business men generally will be satisfied that there has been a turn in business conditions, and that they can go forward safely in making extensions and improvements which require new investments in tools.

In the business actually done recently there has been a good demand for special lines of tools, as well as for hack saws, grinders and smaller tools and machines. There is some scattered buying by railroads, but no large tranactions in the railroad field are reported in this market.

Joseph T. Ryerson & Son, Chicago, recently made a sale of several tools to a Mexican railroad. Included in the order were a flue welding machine and a beveling shear.

The city of Chicago, Ill., is having plans prepared for a thorough overhauling of its water works system.

The Sangamo Electric Company, Springfield, Ill., has under course of construction a two-story brick addition, 40 x 160 ft., in which will be installed its offices, shipping rooms and testing and assembling departments. Not much new machinery will be purchased, but the company will be in the market from time to time for machine tools.

Philadelphia

PHILADELPHIA, PA., November 7, 1910.

Machine tool and machinery dealers almost unanimously report the volume of business transacted in October as unsatisfactory. With extremely few have sales equaled those of the previous month, and several report the smallest business for a long period. Nor do they see any material encouragement for the immediate future. While general trade conditions are apparently on the way toward betterment, it will take some little time, it is believed, for the more extensive buyers of tools to reach the full capacity mark. The railroads in this territory have for the past few weeks been almost entirely out of the market. No fresh inquiries have developed; in fact, quite a few of their recent inquiries are still unclosed. The situation from the manufacturers' standpoint is unchanged; their field is wider than that of the merchants, but even then business is reported irregular and few plants are being operated at capacity and these have, as a rule, but a few months' work ahead.

During the week some purchases have been made, but largely of the single tool character. In nearly all classes of tools deliveries can be made promptly, stocks in merchants' warehouses being large and varied, and in the majority of instances immediate shipment is available.

The demand for second-hand machinery and machine tools continues irregular; there has been no demand along any particular line. A moderate inquiry for boilers and engines comes out, and it appears as if some of the pending business will develop into orders at an early date. No betterment in the export demand for machinery or tools is reported; some few orders have been taken for special equipment, but there has been no inquiry reported for tools of the standard types.

The foundry trade continues irregular; there is probably a little more inquiry for steel castings, prices for which are not very strong. Inquiry for machinery castings is dull, reflecting the condition of the trade. Jobbing foundries are moderately active, and in some cases a very fair demand for builders' cast iron work is reported.

The Preston Company, Drexel Building, is erecting a plant at Bridgeton, N. J., for the preparation of silica sands for foundry use. The plans are for a plant of 600 tons capacity per 10-hour day. While a good share of the machinery and equipment has been provided for, the company is still in the market for a 900-hp. engine and a boiler of 1200 hp.

The Industrial Supply & Equipment Company, engineers' specialties and contractors' equipment, 407 Sansom street, has been appointed sales agent in the territory east of Pittsburgh for the Brown coupling, for high pressure service, manufactured by the Brown Automatic Hose Coupling Company, Cleveland, Ohio.

The Commissioners of the District of Columbia, Washington, D. C., will receive sealed proposals until November 12 for the furnishing and erecting of a complete electric lighting plant for the temporary buildings of the workhouse located at Occoguan, Va. Specifications may be obtained at the office of the Chief, Clerk, Engineering Department, 427 District Building, Washington, D. C.

R. B. Seidel, Inc., crucible manufacturer, has begun the building of a large kiln for burning black lead crucibles. Other improvements to the plant are also under way. The new kiln will increase the burning capacity fully 80 per cent. The demand for crucibles and special plumbago and clay shapes is reported as very good.

The Charles McCaul Company has the contract for the addition to be made to the boiler house at the Tacony power plant of the Frankford, Tacony & Holmesburg Traction Company, at Tacony. Plans call for a one-story brick and steel structure.

The West Chester & Wilmington Electric Railway Company, which was formed about a year ago to build a trolley line between West Chester, Pa., and Wilmington, Del., will, it is stated, be ready to ask for bids for the construction of the road in the near future.

The Philadelphia Roll & Machine Company reports a fair volume of business, with the plant running 80 per cent. of its capacity. Orders are being received both for sand and chill cast rolls, although the quantities are smaller than when general business is more active. The demand for charcoal iron air furnace castings continues good, and considerable heavy machinery work has been taken. The addition to the plant, previously referred to, is completed, and preparations are being made to install the machinery, which has already been purchased.

The Frick Grate Bar Company, which also conducts a general engineering business at 421 Chestnut street, has been appointed sales representative in the Philadelphia district, including eastern Pennsylvania, New Jersey, Maryland and Delaware, for the line of turbo-blowers, manufactured by the Turbo-Blower Company, New York.

The Franklin Brass Foundry Compny, Reading, Pa., will make application for a Pennsylvania charter November 29, to engage in the manufacture of brass, iron or other castings of various kinds. The incorporators named are Frank A. Gring, F. W. Kaucher, Oscar Rickenbach and Henry M. Koch.

The Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., has been awarded the contract for pumping engines for use in the Water Department of Harrisburg, Pa. The installation consists of two complete units, independent of each other, each having a capacity of 1,000,000 gal. per day. One unit is to be driven by a direct connected gasoline engine, the other by electric motor. Each unit is interchangeable, except as to form of drive. The pumps are of the vertical triplex type, having plungers 8¼ in. in diameter and 12-in. stroke. The contract includes the pumps, piping and installation of the equipment. The pump business of this company has been increasing so rapidly that it has been found necessary to double the capacity of some departments connected with the pump manufacture, particularly chilled iron plungers, for the grinding of which a machine having a capacity 20 x 96 in. has recently been ordered.

Robert Erato, West Palmyra, N. J., is in the market for conveying machinery to carry clay from a nearby clay bank to the mill, a distance of about a quarter of a mile. He is also preparing to engage in the manufacture of asbestos products, such as coverings, insulation, &c., for which a plant is now being installed.

The Philadelphia Machine Screw Company notes a very fair demand for various classes of special screws. This concern has recently installed several automatic screw machines, to better enable it to take care of orders for special screws, small parts for automobiles and electrical purposes and special machine screw work.

Cincinnati

CINCINNATI, OHIO, November 7, 1910.

The Buffalo & Susquehanna Railroad Company is reported to have bought a small lot of tools, some of which business benefited Cincinnati machine tool builders. Nearby railroads are very slow in making up their minds to come into the market and only small orders for emergency tools are being placed. With the elections out of the way and with indications for a fair settlement of the rate question, the railroads are not expected to be such disappointing customers as they have been during the past year.

A canvass of local manufacturing industries develops rather peculiar conditions. Some machine tool builders were very busy all through October, while others were compelled to temporarily lay off a few men or else go into building stock tools. In other lines of manufacture, for instance the stove business, local factories generally report October as being the busiest month they have had for years. The sawmill machinery business continues dull, but there is a good demand for small combination woodworking machines.

Taking everything into consideration, the situation is one to make everybody indulge in a general optimistic feeling, and if next spring does not open up with a record breaking business it will be a great surprise to business men in this section of the country.

Work on the new plant of the Cincinnati-Bickford Tool Company at Oakley is being pushed all possible, but the company has been disappointed in not getting into its new quarters on the date anticipated.

THE MACHINERY MARKETS

The frame work of the six-story building for the Ohio Mechanics' Institute, on Walnut street, has been completed and the inside work commenced on. The heating contract, which is one of the largest let in this section of the country lately, was awarded the Attlesey-Dyer Company of Cincinnati.

The Herancourt Brewing Company, Cincinnati, will erect a three-story brick and concrete storehouse and cold storage plant at 1406 Harrison avenue.

The Cincinnati Time Recorder Company, Cincinnati, has increased its capital stock from $50,000 to $75,000. No immediate additions to its plant are contemplated.

The Monarch Machine Company, Sidney, Ohio, builder of lathes, is so busy at the present time that it has found it necessary to materially add to its working force.

The stock of the Royal Rubber Company, Akron, Ohio, has been increased from $50,000 to $200,000.

The Klein-Marshall Furnace Company has been incorporated at Canton, Ohio, with $40,000 capital stock. The incorporators are G. D. Viers, John E. Hisey, Ray E. Viers, O. T. Clewell and H. W. Penrock.

Plans have been completed for an addition to the Isaac Joseph Iron Company's plant on Hunt street, Cincinnati, recently mentioned, but actual work of construction will not begin until next spring.

The new brick building for the Hisey-Wolf Machine Tool Company, on Colerain avenue, Cincinnati, has been completed, and the company expects to move into its new quarters some time this month.

It is reported that J. F. Wright of Canton, Ohio, is the principal promoter of a new company that will erect a factory for the manufacture of a patented pipe wrench.

Plans are being prepared for an addition to the plant of the Gendron Wheel Company, at Toledo, Ohio.

Cleveland

CLEVELAND, OHIO, November 8, 1910.

The local demand for machine tools continues quiet. Dealers report a light volume of scattering inquiries, which are largely for single tools. A large part of the orders are for small tools for new manufacturing enterprises that are starting up in a small way. Little business is coming from large manufacturing plants. In most cases these are holding off expected purchases until they have more work on hand. Local plants making machine tools continue to run near full capacity, but several are pretty well up on orders and some of the tools they are making at present are for stock. A local manufacturer of heavy forging machinery reports an improvement in the situation, having received some good sized orders during the past few days. The demand for this class of machinery has been light for some time, owing to the limited buying by the railroads.

The demand for heavy handling machinery is not active, but plants are well filled with work. New orders are mostly for small equipment. Some good inquiries are pending from the East for coal handling plants. The demand for electrical equipment is rather quiet, being confined largely to medium sized and small motors for industrial plants. Very little business is coming from the electric railways.

Reports from various parts of Ohio indicate considerable activity in the erection of new manufacturing plants and additions, but most of these are outside of metal working lines and will not stimulate the machinery market further, perhaps, than to create an additional demand for power equipment.

The Metals Welding Company has completed a new plant at 4400 Perkins avenue, Cleveland. This company was recently organized to manufacture the Harris type of oxy-acetylene plants, to do job welding of all kinds, and sheet welding and brazing. E. C. Reader is manager of the company. Howard H. Snyder, formerly connected with the Braze Weld Company of Cleveland, is superintendent.

The Superior Drop Forge & Mfg. Company, Cleveland, will shortly begin the erection of a new forge shop, 50 x 100 ft., and will purchase the necessary forge shop equipment. On the completion of this building the company plans the erection of another forge shop of the same size. Plans for the construction are being prepared by the Forest City Engineering Company. The company is located at West Seventy-third street and the Big Four track, where it is now building a machine shop.

The Lake Shore Railroad has an inquiry out for a number of motors for its new shops at Elkhart, Ind. The list of machine tool requirements for those shops is not yet out. This railroad is also planning some extensions to its Collinwood, Ohio, shops, including a new machine and car shop.

The Reliance Mfg. Company, Massillon, Ohio, has been formed by Frank C. McLain and others to manufacture lock washers and metallic matting. The company has leased a building on East Tremont street for a plant and will at once begin operations.

The N. J. Rich Knitting Company, Cleveland, has commenced the erection of a large concrete factory building, 100 x 360 ft. and four stories. It has not yet been decided whether a power plant will be installed or whether power will be supplied by a commercial company.

The Stevens Iron Works & Fireproofing Company, Cleveland, is building a new one-story brick plant on Perkins avenue.

The Ohio Brass Company, Barberton, Ohio, which recently purchased the plant of the Hi-Potential Company in that city, is building a large two-story addition to its plant.

Sealed proposals will be received by the Director of Public Safety, Cleveland, November 18, for a steam and electric generating unit, to be installed at the city colony farm at Warrensville.

The Lawrence Clay Products Company, Canton, Ohio, with a capital stock of $200,000, will begin the erection of a large plant in North Lawrence soon after the first of the year for the manufacture of building brick. John P. Jones is president of the company and William D. Street is secretary.

The James Foundry Company, Clyde, Ohio, will build a new plant, and will buy some foundry equipment.

The Erie Railroad will install a new coal tipple on docks that it is about to build in Cleveland.

New England

BOSTON, MASS., November 8, 1910.

Inquiries are more numerous than they have been, and signs generally indicate that orders should improve from now on. The passing of the election is considered as eliminating a deterrent to business. Few large orders are being placed, nor are there lists of any consequence in sight. Builders of heavy machinery, such as rolls, punches and shears, are having little inquiry for their product, but this trade also is more hopeful than it has been for some time. More active interest on the part of the railroads is having its influence on the general feeling of the trade.

The plant of the H. D. Smith Company, Plantsville, Conn., manufacturer of vehicle and special drop forgings and drop forged fine tools, lost a large portion of its works by fire October 31. The die sinking department, machine room, finishing department and assembling department were destroyed, together with a large amount of stock in process. The forging shops and wareroom were saved, however, and the company is arranging for temporary finishing quarters, and plans to be operating again in about two weeks. Customers are anticipating their wants for future shipment and the company will undoubtedly be able to take care of their orders in the near future.

The H. B. Smith Company, Westfield, Mass., manufacturer of heating boilers, radiators and other steam specialties, is planning large additions to its works for the spring, but at the present time the matter has not gone far enough to permit of the publication of details. The improvements will include both foundry and machine shop additions.

Additions to general manufacturing plants include the following: American Hatters & Furriers Corporation, Danbury, Conn., to rebuild plant recently destroyed by fire with a loss of more than $100,000; Hampden Glazed Paper Company, Springfield, Mass., new factory; E. E. Dickenson Company, Essex, Mass., addition to factory 30 x 150 ft., two stories.

W. & B. Douglas, Middletown, Conn., have brought out a new type of contractors' diaphragm pumping outfit, designed for removing large quantities of gritty water at low cost, and easily portable. The engine has been tried out by public service corporations, for drainage and sewage work, and as a bilge pump on vessels. The unit contains gasolene engine and tank. The capacity is 3000 gal. per hour, and the weight 650 lb., crated.

A. H. Wells & Co., Inc., Waterbury, Conn., manufacturer of seamless tubing, brass, copper, bronze and nickel silver, will build a brick addition to its works, 64 x 107 ft., one story. It will be used for the manufacture of seamless tubing.

The Screw Machine Products Corporation, Providence, R. I., will build a two-story and basement addition to its factory to contain about 20,000 sq. ft. It will be of mill construction and will cost $25,000. The company manufactures screws, nuts, rivets, and other headed and threaded work and turned pieces.

J. V. Critchley has become the sole owner of the Critchley Machine Screw Company, Worcester, Mass., having purchased the interest of the silent partner of the firm. The business was established four years ago in a small room,

THE MACHINERY MARKETS

Mr. Critchley having no assistance in the factory. To-day 80 people are employed, and the equipment comprises 150 screw machines. No machine screws properly are manufactured, the product being confined to special turned work. The company is very busy and is about to resume an overtime schedule of hours. An order just received from an automobile concern calls for 5,000,000 pieces of a special high carbon steel, requiring 235,000 lb. of stock. The company has taken additional space in the building at 100 Beacon street.

A syndicate of Hartford men, comprising Clarence E. Whitney, Whitney Mfg. Company; Robert H. Schutz, Sigourney Tool Company and Smyth Mfg. Company; Edward J. Manning, Royal Typewriter Company, and Herman F. Cuntz, Columbia Motor Company, has acquired 160 acres in the southwestern part of the city, south of the Hartford Rubber Works Company, and will develop the land for industrial purposes. The land is peculiarly adapted to its purpose, because of its natural contour and its proximity to the main line of the New York, New Haven & Hartford Railroad. Not only will new industries be located on this land, but model homes for workmen will be constructed.

The O. C. White Power Company, 15 Hermon street, Worcester, Mass., is in the market for a 125-hp. Corliss engine.

Detroit

DETROIT, MICH., November 7, 1910.

New manufacturing companies, with the established concerns of small or medium size who are adding to their shop facilities, were responsible during October for the best character of buying, and their requirements seem to be expanding rather than diminishing. From the railroads that traverse Michigan, northern Indiana and Ohio there have come to the manufacturers of this State, as well as some of the principal dealers, quite a steady run of miscellaneous inquiries, with the promise of a more substantial volume of buying in the near future.

In the line of foundry work there has recently been a marked revival of business, coincident with the renewed activity in motor-vehicle building and related industries. Operators of such plants will be good buyers of equipment and supplies during the winter.

The plans of the Matthew Lamont Company, Bay City, Mich., for a new factory building include a three-story structure, 96 x 154 ft., of reinforced concrete construction. Power and woodworking machinery, as well as an electric lighting outfit, steam heating plant, &c., will be among the company's requirements.

Plans are reported to be nearly completed for a forge shop to be built as a part of the Detroit Steel Products Company's plant in this city.

A bond issue to provide for the electric lighting plant was recently authorized at an election held in Davison, Mich.

The Cumback Motor Company has been organized in Detroit by A. A. Bailey, W. S. Bailey and R. A. Cumback.

Plans for a water works system at Wayne, Mich., including pumping machinery of a thoroughly modern type are now being prepared.

The Detroit Edison Company, Detroit, whose main power station is equipped with units of 30,000 kw. built by the General Electric Company, Schenectady, N. Y., is planning large additions to its system, the exact extent and character of which have not yet been made public.

A two-story frame addition is being made to the factory of the American Carving & Mfg. Company, Grand Rapids, Mich.

Some additional equipment is to be installed by the Bos-Bolhuis Lumber Company, Holland, Mich., which had been extending its plant.

Cameron F. Roberts, 347 Woodward avenue, Detroit, is secretary of the newly organized Day Automobile Company, and will be in charge of plans for the manufacturing plant which it is proposed to establish here.

A two-story factory, 50 x 90 ft., is to be built in Detroit by Martin Church, who is also reported to be interested in the Page Wire Fence Company, Walkerville, Ont.

The W. J. White Company, Detroit, is letting contracts for the building and equipment of a new two-story factory.

The U. S. Rusk Company, Grand Rapids, Mich., is reported to have completed plans for a two-story factory addition, 45 x 80 ft.

Construction contracts have been let for a new three-story factory building, 70 x 100 ft., to be erected for the Detroit Carriage Company, Detroit.

A machine shop is to be built in Detroit by Arthur Colton on a site 150 x 450 ft. recently acquired. The firm's headquarters are now in the Detroit Gas Company's Building.

A two-story factory building is to be erected in Toledo, Ohio, by the Allen Mfg. Company of that place.

The Coldwater Ladder Company, Coldwater, Mich., is erecting a new factory building.

The Pontiac Motor Cycle Company, organized under the laws of Michigan with an authorized capital of $600,000, is building a plant on a 20-acre tract in Pontiac, Mich. The company will manufacture motor cycles and its buildings now under way include three structures, one 45 x 208 ft., another 55 x 100 ft. and a third 55 x 128 ft. The plant will be equipped with electric power system in motor drive groups, and the company is in the market for polishing and plating devices, oil burning furnaces suitable for steel treatment, oil brazing stands, portable enameling ovens and a line of machine tool equipment suitable for motor cycle manufacture. Allied with the motor cycle company is the Pontiac Drop Forge Company, which is erecting one building 65 x 100 ft. and another 30 x 130 ft. The forge company expects to purchase a line of steam drop and helve hammers from 100 to 250 lb., power shear, drilling and stamping presses, oil burning furnaces for forging, blowers, oil tanks and a complete line of die shop equipment. Robert M. Brownson is president and general manager of both companies.

The Reliable Wire Company has been organized at Muskegon, Mich., with a capital stock of $100,000, to manufacture enameling wire. The company has in course of construction a plant which will be equipped and put in operation as soon as possible.

The B. & B. Buggy Company, Marshall, Mich., has plans prepared for the erection of a new factory building 80 x 300 ft., with a wing at each end 50 x 75 ft., to be erected during the coming spring.

The Newaygo Engineering Company, Newaygo, Mich., will erect in the spring a new factory of fireproof construction for the manufacture of the Newaygo separator, adapted to handling either wet or dry screenings, and other machinery. In addition to manufacturing the company will do an engineering business, specializing in the pulverizing departments of Portland cement, fertilizer and other similar plants. The equipment used by the Newaygo Portland Cement Company has been taken over, but additional equipment will be purchased upon completion of the plant.

Pittsburgh

PITTSBURGH, PA., November 7, 1910.

Purchases of shop, factory and mill equipment are being delayed or only partially made. In not a few instances, within the past month, second-hand or rebuilt machinery has been substituted for new on lists that had been pending for some time. One of the bright features of the situation is the well-sustained demand from nearly all parts of the United States, and many foreign countries, for apparatus to be used in recovering, loading, conveying, and treating heavy material, such as ores, rock, coal, &c. Economy of operation has become a factor of such importance in the various lines of industry affected, with narrowing margins of profit, that replacements of this class of machinery are being made wherever the net results will warrant them. The introduction of electric drive, which is tending to become practically universal for all purposes such as those above mentioned, has led directly to much of the change that is at present going on, and it frequently results in the complete remodeling of handling or treating plants along the most modern lines.

The repair and maintenance facilities of the Pittsburgh & Lake Erie Railroad Company are to be considerably extended, and some purchases of shop equipment will be made within the next few months.

A new carhouse addition, with equipment for repair work, will be built at Butler, Pa., by the Butler Passenger Railway. The plans, however, are not yet complete.

The Malcolm Brake Shoe Company has been organized at Charleston, W. Va., to establish a plant for the manufacture of the railroad specialty mentioned in the title. C. A. Malcolm, Minden, W. Va., is the leading incorporator.

The plant of the Pittsburgh Steel Company, at Monessen, Pa., was inspected by about 250 traffic representatives of the New York Central lines who recently met in Pittsburgh to get a more complete idea of the industrial importance of this district as a freight producer.

The Railway & Industrial Engineering Company, Pittsburgh, is featuring in its sales this fall a tool used in slotting commutators for direct current generators and motors.

The Hockensmith Wheel & Mine Car Company, Penn Station, Pa., has met with much success this season in the sale of the angle bar trucks for mine cars which it handles. A feature of these is the Eureka wheel made in the company's plant.

THE MACHINERY MARKETS

Milwaukee

MILWAUKEE, WIS., November 7, 1910.

The industrial situation here shows further improvement, and some of the men laid off by the larger machinery building plants a few weeks ago are being taken back. Large orders are more plentiful than they were, while a greater aggregate of small orders, routine buying, requisitions for spare parts, repairs, &c., is generally observable. It is the feeling among manufacturers and sales agencies that, if the present favorable tendencies hold throughout November, there will be steady improvement following. This judgment has been based principally upon the new projects or improvements known to be pending, which now fill office files as prospects.

In the northern part of Wisconsin, together with Upper Michigan, there has been very little known of the dullness felt here, and there is now a great deal of activity in all of the mining and timber districts. One of the most pronounced features of this is the growth of local industries supplying material, machinery or other equipment, fabricated metal, boiler and plate work, castings, &c., for which dependence was formerly had mainly upon the more populous centers of Wisconsin or neighboring States. At the same time the volume of trade with Milwaukee, Racine, and other of the more southerly cities has increased considerably.

Representative manufacturers of machine tools and other shop equipment located in Wisconsin seem to be very much in favor of the action taken at the recent annual meeting of the National Machine Tool Builders' Association with respect to noncancellation of contracts. So far as local plants are concerned, however, there does not appear to have been any serious difficulty from the situation which it is sought to remedy.

Plans for a new factory building to be erected next March or April will probably be completed in the near future by the Racine Art Furniture Company, Racine, Wis. The project is not yet, however, in definite shape.

The Petrel Motor Car Company, Milwaukee, will remove in the spring to a new plant situated at the southern limits of the city.

The plant to be built in Appleton, Wis., by the General Mfg. & Machine Company will be used for the production of a new patented range.

A. C. Lingelbach, president of the American Hydraulic Air Compressor Company, 1317-1319 Majestic Building, Milwaukee, states that the company's plans include the erection of a large central plant for furnishing power to manufacturing industries in the form of compressed air. Further details will be made public later on.

Construction contracts are about to be let on a large new pulp mill to be erected at Tomahawk, Wis., by the Tomahawk Pulp & Paper Company. All of the machinery is to be driven by means of electric motors, but it will probably not be necessary for the company to erect a new power plant.

The Bain Wagon Company, Kenosha, Wis., is about to build an addition to its boiler house.

Some machinery, including electric motors, is to be purchased by the Wisconsin Auto Top Company, Milwaukee, for its new factory addition.

Another story, 40 x 116 ft., is to be added to the brass foundry of the National Brake & Electric Company, Milwaukee.

The Wisconsin Bridge & Iron Company, Milwaukee, which maintains offices in the Sheldon Building at Houghton, Mich., is getting a large percentage of the orders for new mining buildings, steel tipples, &c., to be erected on the iron and copper ranges.

New quarters have been secured by the Beaver Mfg. Company, Milwaukee, in a factory building on First avenue, near Oklahoma avenue, which is being remodeled for the purpose. The company will continue in its present location for some months.

As an illustration of the market which builders of heavy machinery here are now finding in the Far North, it is stated that the Alaska Perserverance Gold Mining Company, Juneau, Alaska, has in service at its crushing plant five large gyratory breakers and 50 gravity stamps furnished by Milwaukee companies. An installation of this size would be notable anywhere, but it is surpassed by others in the same vicinity which were originally supplied from the shops of concerns whose headquarters are in this city.

A sprinkler system is to be installed in the new plant of the Waltham Piano Company, Milwaukee.

Some additional buildings are to be erected within the next few months for the Horlick's Malted Milk Company, Racine, Wis.

Otto H. Falk and E. J. Kearney are representatives of the metal working industries on a committee recently appointed by the Merchants and Manufacturers' Association, Milwaukee, to arrange for an industrial exposition in this city in 1911.

M. G. Jeffries, Janesville, is reported to be active in an effort to induce the Brunswick-Balke-Collender Company, Chicago, to erect a branch factory in that city.

The Racine Boat Company, Racine, Wis., is about to let construction contracts on a new shop building, 60 x 100 ft., and a boiler house addition, 40 x 60 ft.

The Independent Electric Mfg. Company, Inc., Milwaukee, will arrange during the winter for enlarging its manufacturing facilities, and is to be in the market for some new machine tools and other equipment. It makes a specialty of starting boxes and controlling devices for a considerable variety of service.

Additional electrical machinery will probably be required in the near future for the plant of the Chicago Brass Company, Kenosha, Wis., which is contemplating some improvements. Definite plans to this end have not yet been determined upon.

The Gisholt Machine Company, Madison, Wis., is letting construction contracts for an extension of its main machine shop, 100 x 200 ft.

Toronto

TORONTO, November 4, 1910.

There is no apparent slackening of the activities that maintain the demand for machinery. Considerable though that demand continues to be, it would undoubtedly be much greater if labor were as plentiful as contractors, manufacturers, lumbermen and other employers desire. In the wonderfully fine weather of this open fall railway building, for one thing, would be carried on upon a larger scale if hands could be got. And, of course, in all such occupations machinery and outfit are directly applied and the implements thus used are the products of machinery in manufacturing works. If there were workers for all the work to be done outdoors and indoors there certainly would be a much enlarged demand for machinery, and the increase in plant capacity would be greater. The conditions of the trade are very favorable.

The Backaway Pulp Timber Company has been incorporated under Dominion authority, with a capital stock of $250,000, its head office to be at Toronto, Ont.

The Wayagamack Pulp & Paper Company has been incorporated under Dominion authority, with a capital stock of $5,000,000, its head office to be at Montreal, Que.

The Town Council of Englehart, Ont., has decided to issue debentures for $30,000, the money to be used in the construction of a hydroelectric power plant at the High Falls.

The Canadian Underwriters' Association has had the fire appliances and water works of the town of Picton, Ont., inspected, and has found that the whole of the system should be overhauled, that modern equipment should be put in and that the pumping capacity should be increased by 1,000,000 gal.

The City Council of Victoria, B. C., has authorized the expenditure of $50,000 for the purchase of additional fire fighting apparatus. This is a consequence of the $1,000,000 fire that visited the business quarter about 10 days ago.

The Moose Mountain Mining Company, of which D. D. Mann, Toronto, is one of the active directors, has decided to add to its works at Sellwood, Ont., a Grondahl process plant.

Patterson Bros., a shoe manufacturing firm at Duluth, Minn., have a proposal before the City Council of Portage la Prairie, Man., to establish a $75,000 factory in the latter city. They would employ 150 hands the first year and 250 hands after that.

A cold storage plant is to be erected in Edmonton and the government of the Province of Alberta is expected to grant it a subsidy.

The Stewart Sheaf Loading Company will erect a factory in Elmwood, Man., for the manufacture of sheaf loaders.

Preparations are being made for the reconstruction and re-equipment of the Renfrew Electric Company's plant, which was recently destroyed by fire, in Renfrew, Ont.

The Mead-Morrison Company of Chicago is installing the machinery for the large addition the Canadian Pacific Railway Company is making to its coal sheds at Fort William, Ont. Two screening and pick-up rigs will be put in. The cost of the improvements is to be $100,000.

The Murray Drilling Company, Victoria, B. C., is purchasing new machinery for the oil boring operations it is carrying on at Muir Creek.

Machinery for the new plant the Independent Rubber Company is erecting at Merritton, Ont., will be put in late next month. The Canadian Car & Foundry Company at Am-

THE MACHINERY MARKETS

herst, N. S., has lately received some important contracts for baggage cars and snowplows.

Kuhne & Anderton of Beaver Falls, Pa., propose to establish a branch plant at Port Hope, Ont., for the manufacture of steel door mats.

An addition is being made to the plant of the Colonial Wood Products Company at Thorold, Ont., and a considerable quantity of new machinery will be installed.

A contract has been let for the new buildings the Toronto Electric Light Company is to erect in Toronto at a cost of $100,000.

The Galt Motor Company, Galt, Ont., is making an addition to its building, the new space being required for the manufacture of two-cycle engines. The engines will be of capacities varying from 5 to 60 hp.

The Sutherland Fence Company, Sarnia, Ont., has found it necessary to provide itself with larger premises and has started to build a factory 100 x 150 ft., in which woven wire will be made.

The John Palmer Company, Fredericton, N. B., is increasing its capital stock from $75,000 to $125,000 and will add to the capacity of its plant.

The Brompton Pulp & Paper Company, East Angus, Que., is spending $200,000 on new buildings and equipment.

A by-law will be submitted to the ratepayers of Steelton, Ont., to authorize the expenditure of $30,000 for the construction of a lighting plant.

The Amherst Malleable Company, Amherst, N. S., is extending its premises by an addition in which it is expected to employ 150 men.

A four-story building is being added to the works of the Amherst Boot & Shoe Company, Amherst, N. S.

The ratepayers of Welland, Ont., have ratified a by-law providing for the expenditure of $52,000 on water works.

Proposals for the erection and installation of an electric light and flour plant and flour mill are invited by the Mayor and Council of Maple Creek, Saskatchewan.

H. E. Blasingham, Loganport, Ind., has inquired of the Town Council of Berlin, Ont., what inducements the municipality offers for the establishment of a factory his company desires to locate in Canada for the making of automobiles to sell at $750 to $900. W. Arrowsmith, Morrisburg, N. J., is also in communication with Berlin in reference to a project to put up a Canadian branch factory in which to make foot arch supports.

A steam heating boiler made by the Gurney Foundry Company, Toronto, Ont., for the opera house at Brockville, Ont., is said to be the largest ever made in Canada.

The works of the Ontario Wheel Company, Gananoque, Ont., were destroyed by fire on November 3. The loss, estimated at $125,000 or upward, is covered by insurance.

The Brandon Electric Light Company's central station heating plant is ready for the winter's business, and the demand is so great that the company finds it necessary to extend its system by adding mains. Brandon, Man., is the first Canadian city to have a central heating plant.

The town of Biggar, Saskatchewan, is issuing $15,000 debentures for the carrying out of a scheme of water works improvement and fire protection equipment.

Telfer Bros., Collingwood, Ont., propose to add $21,000 worth of new machinery to their woolen manufacturing plant.

F. J. Wellwood, Elmwood, Man., is preparing plans for the addition of a shoddy mill to his plant.

It is officially announced that the amount to be expended by the Canadian Pacific Railway Company on improvements in connection with the Place Viger new passenger and freight terminals and freight shed is $3,000,000.

The steamship Beaverton brought a cargo of machinery to Port Arthur, Ont., a few days ago for the Western Dry Dock & Shipbuilding Company's plant there.

In the spring the National Electric & Heating Company will move from Galt, Ont., to Toronto, where a large building is being constructed for it.

The city of Saskatoon, Saskatchewan, is selling £88,600 bonds in London, England, the money to be applied to public works.

Price Bros. & Co., Quebec, Que., are offering £1,000,000 first mortgage bonds in London, the proceeds to be used in the building and equipment of large pulp and paper mills.

J. H. Plummer, president of the Dominion Steel Corporation, Sydney, N. S., says that the construction of a sixth blast furnace is being arranged for by his company, and that preparations are being made to change from the production of wire rods to the production of other forms of steel should that alternative be made necessary by the Government's tariff policy.

It is stated that the Robert Stewart Company, Guelph, Ont., will enlarge its plant and that machinery to be driven by electric power will be installed in a new building to be erected.

A by-law to raise $4,500,000 for a visible water supply system in Winnipeg was referred to the Fire, Water and Light Committee of the City Council.

The Saskatchewan Flour Mills Company is erecting a large oatmeal mill at Moose Jaw, Saskatchewan.

Parties from Detroit are negotiating with the Publicity Commissioner at Ottawa, Ont., for the establishment of an automobile plant in the latter city.

The outlay on the branch knitting mill the Penman Company of Paris, Ont., is enlarging in Brantford, Ont., is to be from $75,000 to $100,000.

Subscriptions are being asked for the taking up of the $15,000 stock the Canada Grain Shocker Company desires to sell to local investors in Chatham, Ont., where its works are being put up.

G. Carter, Son & Co., St. Mary's, Ont., are to become the Carter Milling Company. A cereal mill will be installed and $150,000 of preference stock will be issued to pay for its construction and equipment.

The Manitoba Bridge & Iron Works Company, Winnipeg, Man., announces that it is open to purchase a belt driven compound air compressor, equipped with inter-cooler and automatic cut-off, capacity to be 700 cu. ft. of free air per minute compressed to 100 lb.

The King George Mine Company, Cobalt, Ont., intends to install a compressor at the mine.

F. C. Gamble, engineer of the Public Works Department at Victoria, B. C., is calling for tenders, first, for the superstructure and, second, for the erection of a two-span steel bridge over the Thompson River on the line of the Canadian Pacific Railway 218 miles east of Vancouver, B. C. The contracts will be open to tender until November 28.

The Alabastine Company of Paris, Ont., is putting up a building 55 x 108 ft. at its mine near the village of Caledonia, Ont., and will put in a new plant for crushing the gypsum and manufacturing it into merchantable forms.

The Canadian Locomotive Company, Kingston, Ont., has received an order from the Canadian Pacific Railway Company for 10 10-wheeler engines.

The Dominion Sewer Pipe Company, Swansea, Toronto, Ont., is erecting a brickmaking plant at Waterdown, Ont.

A site of 4 acres has just been purchased in Toronto on which a large factory employing several hundred men is to be built. Particulars are yet withheld.

Montreal, London and Winnipeg City Councils are all considering the purchase of motor engines for fire protection service.

P. Butchart of Tod Inlet, B. C., is reported to be about to establish a plant at St. Boniface, Man., for the manufacture of Portland cement. To run the factory 2000 hp. will be required.

The Diebel Company's chair factory at Hanover, Ont., was totally destroyed by fire October 3. The loss is covered by insurance.

The South

NASHVILLE, TENN., November 7, 1910.

Salesmen are meeting with more success in closing negotiations that have long been awaiting approval. It is freely predicted that during the coming fortnight there will be more contracts signed than in either of the two preceding fall months and that a period of ordering for a reasonable distance ahead is about to take the place of the hand-to-mouth buying that has thus far prevailed. Steam boilers, heaters, pumps and auxiliary apparatus, together with power and electrical machinery of every description have been the mainstay of a large portion of the market this fall, with every indication that the demand from similar sources will take a great deal more equipment of this character within the next few months. To a very considerable extent the requirements of users are being met by boilermakers, engine builders and manufacturers of pumps, electrical machinery, &c., located in the South. In fact, the percentage of such trade supplied by the plants of this section appears to be much larger than in any previous season.

The Solomon-Norcross Company, Atlanta, Ga., has prepared plans for an addition to the electric light plant at Shelbyville, Tenn., owned by J. F. Boyd of that place. New hydroelectric units aggregating 400 to 500 kw. will be provided as soon as the details have been fully worked out.

The Lenoir Car Works, Lenoir, Tenn., is making additions to its equipment, including the installation of two traveling cranes built by the Northern Engineering Works, Detroit, Mich.

J. B. McCrary, Atlanta, Ga., has undertaken the construction of a complete system of water works at Ashboro, N. C., which will include a pumping unit of 750,000 gal. daily capacity and a steel tower and tank.

The purchase of an additional centrifugal pump for the

THE MACHINERY MARKETS

water works system at Richmond, Va., has been recommended by a committee, which recently investigated the requirements of the service.

Heavy purchases of refrigerating machinery will be made in the near future by the Atlantic Ice & Coal Corporation, Atlanta, Ga., which has decided upon extensive betterments at its various plants.

For the new power plant to serve its extended shops at Boyles, Ala., the Louisville & Nashville Railroad has ordered six water tube boilers, aggregating 1800-hp. capacity, at normal load, from the Henry Vogt Machine Company, Louisville, Ky.

The Pan-American Mining Company, Gulfport, Miss., which is developing a group of mines in Mexico, will provide equipment in the near future for a concentrating plant to serve the various properties. It is expected that electric power will be utilized throughout.

The sawmill at Stevenson, Ala., which burned some weeks ago, will be rebuilt by J. F. Mitchell.

In consequence of important extensions and improvements to be entered upon shortly, additional power units will be required for the electric generating station of the Augusta-Aiken Railway & Electric Company, Augusta, Ga.

The Casey & Hedges Company, Chattanooga, Tenn., will be awarded the contract for repairs to the water works system at Key West, Fla.

Plans are now being made for the new municipal power plant at Jacksonville, Fla. The machinery installed in the present station will be sufficient in the beginning, as it includes steam turbine units of the most modern design, but ample provision will be made at the new plant for future extensions.

Construction contracts covering the extension of the plant of the American Brake Shoe & Foundry Company, at Chattanooga, Tenn., were recently awarded. The details of equipment are now being decided upon.

A timber cutting plant and planing mill is to be installed at Red Bay, Ala., by Grissom & Barton.

The Seaboard Pipe Foundry Company, Savannah, Ga., is planning for the erection of a large plant which will include a main shop, 104 x 185 ft.; machine shop and tapping room, 56 x 100 ft.; storeroom, 50 x 100 ft., and cleaning room, 35 x 100 ft. The buildings will be of steel and concrete construction.

The Red Star Lumber Company has been organized, with an authorized capital stock of $150,000, to establish sawmills at Mayna, La. The company has large holdings of land in Louisiana and has one mill in operation at Mayna for the manufacture of cypress shingles. A modern band mill will shortly be installed, together with other improvements. O. S. Jones is president of the company.

The Southwest

KANSAS CITY, MO., November 7, 1910.

The effect of new construction among plants engaged in or affiliated with the metal working industries is beginning to be felt in the machinery market, where more inquiries for tools have been observable lately than for some time. Orders, however, seldom cover more than a few machines at a time. The bulk of the buying, outside of what is done for the account of new factories, appears to originate chiefly with shops at interior points, where funds realized from the sale of the grain crops are finding their way into investments for local industries.

All public utilities at Clayton, New Mexico, are now under the control of the city, and the construction of a new electric power and pumping plant will probably be entered upon within the next few months.

The city of Altoona, Kan., has engaged an engineering firm in Kansas City to prepare plans for a system of modern water works.

A mechanical filtration plant is to be purchased by the city of South Fork, Ark. Plans have been ordered drawn.

A heavy crushing plant is under erection by the Union Basin Mining Company at Union Basin, not far from Kingman, Ariz., to serve the new concentrating mill recently completed. Other improvements are to be made later.

From Marked Tree, Ark., it is reported that T. J. Turner will build a timber cutting plant and handle factory.

The enlargement of the power and pumping plant operated by the city is under consideration at Tucson, Ariz.

The Miami Copper Company, Miami, Ariz., is rushing work on additions to its plant, including a new concentrator and a large electrically operated pumping station, which will be located three miles distant. Extensive purchases of equipment for the account of this property will need to be made at intervals for some time to come.

The Arizona Power Company, Prescott, Ariz., is considering the erection of a new transmission line from Jerome to Fossil Creek, a distance of 163 miles, and the installation of a 300-hp. compressor.

The Bisbee Light & Power Company, Bisbee, Ariz., will remodel its gas plant.

The city of Columbia, Mo., has engaged M. E. Fawkes as engineer in charge of improvements to the electric light and water works, for which bonds in the sum of $125,000 were recently voted. The improvements to the electric light plant include the erection of a building and boiler plant, rearrangement of street lighting system, installation of 750-hp. electric generating plant, comprising new 500-kw. high pressure steam turbine generating unit and a 250-kw. generating unit.

The Fox-Harris Machine & Supply Company, Pine Bluff, Ark., is erecting a one-story building, 120 x 154 ft., which will be ready and equipped by January 1.

The Northwest

MINNEAPOLIS, MINN., November 7, 1910.

The almost continuous good weather of the past month exerted a favorable influence upon buying, as it led to many purchases which would ordinarily have been deferred until spring. Contractors in particular are proceeding with work that they contemplated abandoning, and quite a number of plans for new buildings which were only contemplated came to a sudden head, so that the present fall is witnessing great activity in this line. How much longer it will continue is, of course, dependent upon conditions. In several respects, however, the effect will be felt upon purchases for new plants or additions, the necessity for which has been created by this season's work. For example, between now and the renewal of construction work in March or April there cannot fail to be a heavier demand for woodworking machinery than in any former year, as the season that is just closing witnessed decided difficulty in obtaining deliveries of material for interior finishing, sashes, doors, pilasters, columns, &c. Plans are therefore now under way for numerous shops, fully equipped to turn out builders' supplies of this nature, which will be located in the smaller cities all through the Northwest, as well as in the centers from which such material is ordinarily secured.

Robinson, Cary & Sands, St. Paul, were recently awarded the contract by the city for a feed water heater, condenser and other apparatus to be installed in the Centreville pumping station.

The Minneapolis Steel & Machinery Company is erecting a large steel tower and tank at Cass Lake, Minn., for the Cass Lake Water & Power Company.

Further hydroelectric power development will result in the vicinity of Chisholm, Minn., from the formation of the Mesaba Range Power Company, which has acquired the plant heretofore operated there by the Range Power Company.

The American Brake, Shoe & Foundry Company will erect on its property in Minneapolis a new storehouse 40 x 80 ft.

The Roanoke Mining Company, on Elk Creek, near Wallace, Idaho, is providing a large quantity of new machinery for its property, including an air compressor, hoist and pumping units. Other equipment will be required after the completion of the development work now to be undertaken.

New machinery will be needed shortly for the American-Kootenai property at Libby, Mont., which will be worked by the Montana Consolidated Mining Company, recently organized for that purpose.

The installation of a pumping plant to serve the community is under consideration at Tower, Minn.

Extensive improvements will probably be made next spring in the water works system at Slayton, Minn.

The authorities at Chinook, Mont., have under consideration the granting of an electric power and lighting franchise to S. W. Swenson.

The North West Paper Company, Brainard, Minn., is having plans drawn for a new manufacturing plant, which will be driven in every department by means of electric motors.

It is reported from Duluth, Minn., that additions to be made to the Gogebic Steam Boiler Company's works there will include a two-story shop, 40 x 88 ft., increasing the company's floor space about 35 per cent. The construction contract has already been let.

The Nisqually Iron Works, Tacoma, Wash., has acquired a plant recently occupied as a repair shop by the Chicago, Milwaukee & Puget Sound Railway and will do a general repair business. The plant is equipped to repair locomotives, engines, logging machinery and other heavy equipment. The company expects to install additional machinery, including a 48-in. throat punch and shear and a set of 8 or 10 in. rolls.

THE MACHINERY MARKETS

San Francisco

SAN FRANCISCO, CAL., November 2, 1910.

Machine tools remain inactive, local inquiries being of smaller consequence than last month. Merchants note a barely perceptible increase in sales for the valley towns, consisting entirely of small orders for single tools. Such articles are purchased only from stock and for prompt delivery, in view of immediate needs. Some of the local shops are now fairly busy, manufacturers of pumping machinery and gas engines having about an average volume of business on hand, with few orders of unusual importance.

There is a fair inquiry for general contractors' equipment, though few large orders are expected until the first of the year. The principal railroads are curtailing new construction work, the most important development on which contracts are still coming out being the Northwestern Pacific line between Willitts and Eureka, Cal. Work will be continued through the winter, however, on several large irrigation projects, for which some machinery contracts have recently been placed. Heavy crushing machinery is quiet and there is apparently a large surplus of crushed rock around San Francisco and in northern California, owing to the decreased demand for railroad ballast. Small crushers and some types of road machinery, however, still find a ready market. There is a fair demand for brick and cement working machinery through the State as a whole, though little important business is coming out.

Export trade is fairly active. Large shipments have recently been made to the Hawaiian Islands, including a 35-ton turbine for a dredge at Pearl Harbor and a lot of equipment for the Hilo Railroad. A large amount of mining machinery has also been sold in Los Angeles for shipment to South America and local manufacturers in this line report a number of new orders.

The demand for mining equipment in California, Nevada and Arizona has been limited for the last two months, partly owing to the shortage of water power, but inquiry in this department is now becoming general. Air compressors and drills are in especially strong demand at present and a number of mines are figuring on hoisting equipment, ore mills, &c. There is considerable activity in electric power equipment, both steam and hydraulic, and there is a good outlook for installation during the coming year.

The Joshua Hendy Iron Works, San Francisco, has taken a contract for three more pumps for the Sacramento Valley Irrigation Company, with a capacity of 2,000,000 gal. per hour, at a price of about $30,000.

N. E. Otterson, special representative of the Chicago Pneumatic Tool Company, with offices at 71 First street, San Francisco, has just returned from a trip to the East.

The Machinery & Supply Company, recently incorporated, has established offices at 61 Fremont street, San Francisco, and has secured a warehouse near Second and Bryant streets, where a large stock will be carried. Sales offices will also be opened at Los Angeles and Seattle, Wash. The stock will include a line of heavy duty induction motors of the Ideal Electric & Mfg. Company, Mansfield, Ohio; power and filter presses of Wm. R. Perrin & Co., Chicago; Dick and Church boilers of the Phœnix Iron Works, Meadville, Pa. It will also act as agent for the Pittsburg Transformer Company, the W. S. Rockwell Company and others. The personnel includes R. B. Elder, former local manager for the Allis-Chalmers Company; H. C. Wybro, former president of the Wybro-Hendy Company, and A. E. Mason, formerly in charge of the forge and furnace department of the Allis-Chalmers Company at Milwaukee.

Geo. E. Pancoast, chief engineer of the Hearst news service, has closed contracts for a large amount of machinery, including a number of General Electric motors, for the Hearst Building in San Francisco.

It is reported that E. W. Hartman, Sacramento, Cal., who is building a concrete barge, is planning to install a large plant at Oakland for the manufacture of concrete piles and barges.

The Zierath Combination Drill Company has been incorporated at Los Angeles, with a capital stock of $500,000, by J. N. Cole, A. G. Pfannkuchen, H. C. Dillon, J. Scott and E. Galley.

The cupola of the Pasadena Foundry Company, Pasadena, Cal., was wrecked by an explosion on the night of October 26. It is believed that the damage was caused by dynamite. This company was recently incorporated, with a capital stock of $50,000, by F. A. Hopping, C. V. and J. M. Wishart, E. O. Elgin and W. J. Coleleuth.

The Joseph Goodrich Power & Tool Company has been incorporated at Los Angeles, with a capital stock of $200,000, by J. Goodrich, C. H. Barry, H. M. Frye, A. L. Jameson and J. W. Doyle.

The Chico Iron Works, Chico, Cal., has taken a contract for a large dredge of the Oroville type for Mrs. A. E. Drexaer of San Francisco, for use in the Sacramento Valley.

The Mountain Quarries Company, which controls lime quarries near Auburn, Cal., announces that a 3-mile aerial tramway will be built between that town and the quarries.

Work is proceeding on the new sugar factory at Anaheim, Cal., contracts having already been let for the erection of the principal buildings.

The Pacific Tank Company has secured a large tract at Los Angeles, where a woodworking plant will be installed.

Plans are under discussion for the installation of a lot of waterworks machinery at the municipal plant of Porterville, Cal.

The town of Bakersfield, Cal., is in the market for a gas engine, hoist and a 36-in. rock screen.

Howard Berry of Melbourne, Australia, is looking over the California market for fruit packing machinery.

The new dredge for the Natomas Consolidated of California will be built by the Yuba Construction Company, Marysville, Cal., which has for some time made a specialty of this class of work.

A large air compressor and a lot of pumping machinery have been ordered for the Cassidy Consolidated mine, near Grass Valley, Cal.

A 2-ton skip and a 100-hp. electric motor will be installed at the West End mine, Tonopah, Nev., replacing steam hoisting equipment.

The Western Pipe & Steel Company, which recently commenced operations in its new plant at Richmond, Cal., will shortly erect a new building for the manufacture of boilers.

Two locomotives which were used in leveling the sand hills in the present downtown district of San Francisco have been donated to the museum at Golden Gate Park. They were the property of David Hewes and were brought to California in 1858.

The Alamotis Water Works Company, Long Beach, Cal., is planning extensive additions to its present system of water works.

The Southern California Chemical Company, Los Angeles, Cal., is considering the erection of a new plant at a cost of about $100,000.

Farther Central West

OMAHA, NEB., November 7, 1910.

The demand for machinery of all kinds continues fair and it would not take much of a buying movement to bring about considerable activity, but at present there is no life to the situation. From information gathered by one of the leading commercial organizations of this section, for the guidance of its own industrial committee, it appears that an immense volume of new building and plant improvements is only waiting for proper encouragement to be put into effect. All of the existing plants appear to be doing very well and this has, of course, a strong influence in imparting confidence to those who waver about making investments in local industries.

The Musgrave Fence & Auto Company, Des Moines, Iowa, will erect a seven-story warehouse and office building to replace the structure that recently burned.

The chief engineer of the Monticello Electric Company, Monticello, Iowa, is preparing plans for the new power plant to be built in the spring.

A metal working plant, including foundry and machine shop, will be built at Moravia, Iowa, by J. A. and J. Q. Hiatt. For the present temporary facilities are being provided.

As soon as a proper site has been selected by the authorities at Webster City, Iowa, steps will be taken for the erection and equipmnet of a municipal power and lighting plant.

It is reported from Des Moines, Iowa, that, through the efforts of interests identified with the Commercial Club there, several new industries have been induced to locate in that city. These include a silo manufacturing plant to be established by E. D. Hawkins & Co., Unadilla, N. Y., and a factory to be built by the Adel Mfg. Company, Adel, Iowa.

A 200-kw. generator furnished by the General Electric Company, Schenectady, N. Y., which will be driven by a hydraulic turbine, is being added to the plant of the Glenwood Light & Power Company, Glenwood Springs, Colo.

The Eagle Iron Works, Des Moines, Iowa, is meeting with excellent success this season in the sale of its large ventilating fans of the Miller central disk type, which show high efficiency at moderate speeds. Its design includes ring oiling bearings and force feed lubrication.

It is reported from Creston, Iowa, that the local pumping plant and water distribution system, controlled by private interests, will be extensively remodeled and enlarged.

Plans for the construction of a modern pumping plant at Fremont, Neb., have been submitted to the City Council.

As soon as a franchise has been granted for the purpose

THE MACHINERY MARKETS

R. O. Prather, Griswold, Iowa, will install an electric power plant at Elliott, Iowa.

The construction of a pumping plant and complete system of water works has been authorized at Adair, Iowa.

The equipment of the Herald Mining Company, Boulder, Colo., is now being operated by means of electric power, and the system of motor drive will be enlarged as the works of the company is extended.

The plans of the Omaha Structural Steel Works, Omaha, Neb., for a new fabricating plant include a shop building 120 x 250 ft., to be erected at Forty-eighth and Leavenworth streets. The details of construction and equipment have not yet been fully worked out.

The Interstate Investment & Development Company, Charles City, Iowa, which owns 480 acres of land containing large quantities of marble, lithograph stone, Portland cement and brick materials, is negotiating for plants to be installed during the spring of 1911. Plans are now being considered by the company for the erection of six plants which will be equipped with modern equipment, the purchase of which is now being considered. The company proposes to erect a brick plant with a daily capacity of 17,000 to 20,000 bricks, Portland cement plant with a daily capacity of 3000 barrels and a marble plant.

The Colby Motor Company, Mason City, Iowa, which has been occupying temporary factory quarters for some time, is now erecting its own building, 150 x 450 ft.

Southern Texas

AUSTIN, TEXAS, November 4, 1910.

Several of the independent railroad projects that have been in process of incubation for the last several months seem to have almost reached the point of realization in Texas. A few construction contracts have recently been let, and similar action is promised as to other lines in the near future. The established railroad systems are apparently planning no extensions of improvements for the early part of the coming year; considerable work is being done, but it is the carrying out of plans that were adopted some time ago.

Preliminary steps have been taken for the construction of a cotton compress in Corpus Christi, Texas, to cost about $30,000. Roy Miller, secretary of the Commercial Club, is promoting the project.

The Trinity Valley Traction Company will soon finish locating the route for its proposed interurban electric railroad that is to be constructed from Dallas to Palestine, Texas, abut 100 miles. Considerable machinery will be required for the power plant. J. V. Watkins of Dallas is interested in the project.

The Taylor Water Company will install a larger pump at the San Gabriel River pumping station, and make other improvements and considerable extensions of its water works system at Taylor, Texas.

Theodore Stegner of Kansas City, Mo., will apply to the City Council of Brownsville, Texas, for a franchise for the construction of an electric light and power plant and a street railway system. He states that he will also erect an ice and cold storage plant and a canning and preserving factory.

D. McNeill Turner, Corpus Christi, is preparing to make application to the City Council for a franchise for a gas plant and distributing system.

The Cactus Milling Company will install a mill at Corpus Christi for the manufacture of stock feed. An investment of about $25,000 will be made in the plant.

The Southwestern Portland Cement Company will double the capacity of its plant at El Paso if it is successful in securing the contract for furnishing cement for the Government dam at Elephant Butte, which is a part of the large land reclamation project. The present capacity of the plant is 1500 barrels of cement per day. This will be increased to at least 2500 and probably to 3000 barrels, it is stated.

A new town will be established and other improvements made on a ranch of 44,000 acres in McMullen County, Texas, by the Two Rivers Ranch Company, Wichita, Kan. The land will be divided into farms and colonized. The plans involve the installations of considerable irrigation machinery.

Irrigation machinery and considerable structural material will be required in carrying out the plans for the development of 35,000 acres of land near Christine, Texas, by its owner, Dr. C. F. Simmons of San Antonio. He will establish three towns on the property.

The establishment of a plant at Dallas for the manufacture of stationery of various kinds is contemplated by the Kalamazoo Stationery Company, Kalamazoo, Mich.

The City Council of Yoakum, Texas, has under consideration the construction of a complete and modern system of sewers. It is also planned to acquire the plant and distributing system of the local water company, and if this is not done to have the town establish its own water works system.

C. S. Fowler & Bro., San Antonio, who are developing a ranch of 65,000 acres on the Frio River, 18 miles from Gardendale, with the view of colonizing the property with farmers, will install a large pumping plant and system of irrigation.

The North Texas Gas Company will extend its natural gas pipe line from Fort Worth to Ennis, a distance of about 50 miles, and the preliminary arrangements looking to the fulfillment of the project are under consideration.

An electric light plant will be installed and a water works system constructed at Bellaire, Texas.

Machinery will be installed for the new water works plant for the town of Cuero, Texas. Capt. F. R. Perkins of Dallas is in charge of the construction work.

The machine shops of W. G. Forsyth at McKinney, Texas, which were recently destroyed by fire, will be rebuilt.

Part of the machinery in the main building of the Merchants' & Planters' Oil Company's mill at Houston was destroyed by fire recently. It will be replaced with new machinery.

R. T. Pruitt will build a large cold storage plant in San Antonio, to cost about $25,000, to replace the plant recently destroyed by fire.

The City Council of Bryan will construct a complete system of sewers, and when that improvement is finished the municipal water works system will be extended and otherwise improved.

Alberto Heredia will establish a factory at Chihuahua, Mexico, for the manufacture of heavy pasteboard from waste paper.

The Grabill Industrial College, an American conducted institution at Montemorelos, Mexico, will erect a factory for the manufacture of boxes. It is already manufacturing school and household furniture and this factory will be enlarged. Its new shop building will soon be equipped with machinery. J. R. Lowe is mechanical engineer of the institution.

Jose Farjas will install a large pumping plant as a part of the irrigation system which he will construct to water about 25,000 acres of land in the valley of the San Lorenzo River, near Culiacan, State of Sinaloa, Mexico.

The Mexican Iron & Steel Company, an American concern which acquired the iron mines and foundry at Tula, State of Jalisco, Mexico, some time ago, has adopted plans for the erection of modern iron and steel works, a tool and implement factory and a plant for the manufacture of by-products from charcoal.

North Pacific Coast

PORTLAND, ORE., November 4, 1910.

Summaries of market conditions recently made by leading machinery men are practically repetitions of the reports for the past few weeks, with the difference that greater emphasis can now be laid upon almost every detail of improvement in trade.

Norman R. Smith, general manager of the newly organized Hydro Patent Power Company, Portland, Ore., whose plans were recently mentioned, states that the company is now prepared to demonstrate the possibility of watering lands adjacent to running streams at a very low rate per acre. It is the expectation that a number of branch factories for the production of machinery used in their process will be established at various centers in addition to the main plant in Portland.

The Baker City Sampling Works, Baker City, Ore., will be enlarged, remodeled and equipped with the most modern machinery, having passed under the control of the Oregon-Idaho Investment Company of that place.

The Pacific Electric Engineering Company, Portland, Ore., whose headquarters are at 213 Second street, has been making a specialty this year of designing and installing electric power and lighting plants for sawmills, planing mills and other service of a similar character.

A steady buyer in future of factory supplies will be the Nicholai Door & Mfg. Company, Portland, Ore., which is completing a new plant.

The Phœnix Iron Works, Portland, Ore., whose foundry, machine and boiler shops are on Hawthorne avenue and East Third street, has had a heavy line of repair work this season in addition to the large and varied line of machinery, structural iron and steel, water gates, hydrants, hydraulic giants and other material which it handles. In the line of equipment for logging and sawmill work business has been particularly good.

THE MACHINERY MARKETS

The construction of a timber cutting plant northeast of its Cazadero hydroelectric power station is under consideration by the Portland Railway, Light & Power Company in order to provide material for contemplated extensions in that direction.

In the Alaskan trade there have recently been prominent the so-called Pony dredges built by the Hammond Mfg. Company, Portland, Ore., which perform practically the same service as the larger plants and can be operated at much lower cost. These dredges are also being used to excellent advantage in the smaller shallow streams of Mexico and South America where gold bearing bottom is found.

A vote will be taken in December at Vancouver, Wash., on the matter of issuing bonds for the proposed water works system.

Work on a sash and door factory will probably be started late this fall by the Cedar Creek Lumber Company, Spokane, Wash.

M. A. Phelps & Co. are preparing to erect a large new timber cutting plant, electrically operated, at Cusick, Wash.

Bonds for the installation of a water works system have been voted at Toledo, Ore.

The construction of a modern system of water works is under consideration at Waverly, Wash., where a bond issue to provide funds for the purpose will probably be voted upon in the near future.

The Spokane Corrugated Culvert & Tank Company, Spokane, Wash., has been incorporated with $20,000 capital stock. The company will erect a plant for the manufacture of sheet metal products. The incorporators are John S. Beall and C. A. Foster of Portland, and H. G. Harrison of Spokane.

Government Purchases

WASHINGTON, D. C., November 7, 1910.

The Paymaster-General, Navy Department, Washington, will open bids November 15, under schedule 2992, for two Hartness flat turret lathes.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids December 3 for two 300-hp. boilers, piping, economizer, flue, boiler feed pumps, motor generator set, wiring, &c., for the United States naval station, New Orleans, La.

The Paymaster-General, Navy Department, Washington, will open bids November 15, under schedule 3030, class 21, for two steam double cylinder deck winches.

The United States Engineer, Engineer's Office, *Chronicle* Building, San Francisco, Cal., will open bids November 28 for furnishing and installing electrical machinery on draw bridges across Tidal Canal, Oakland Harbor, Cal.

Bids were opened by the Bureau of Supplies and Accounts, Navy Department, Washington, October 25, as follows:

Class 21.—One motor driven geared head lathe—Bidder 52, Fairbanks Company, Washington, $786 and $802; 70, Hendey Machine Company, Torrington, Conn., $990; 85, J. P. Kemp, Baltimore, Md., $864.50; 92, Manning, Maxwell & Moore, $990.

Class 51.—One high speed friction saw—Bidder 124, Henry Pels & Co., New York, $1137; 129, J. T. Ryerson & Son, Chicago, Ill., $1538.

The Isthmian Canal Commission, Washington, D. C., opened bids October 27, under canal circular 608, as follows:

Class 3.—One washer cutting machine—Bidder 11, Fox Brothers & Co., New York, $3217; 14, Hilles & Jones Company, Wilmington, Del., $1250; 25, Manning, Maxwell & Moore, New York, $1130, $510, $1900 and $536; 28, Nicetown Plate Washer Company, Philadelphia, Pa., $1800.

F. E. Arnold, Constructing Quartermaster, New London, Conn., opened bids for constructing pumping station, &c., at Fort Terry, N. Y., October 25, as follows:

M. L. Baird & Co., Philadelphia, Pa., $9850.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids November 1, as follows:

Schedule 2948, class 1.—One belt driven crank shaft grinding lathe—Bidder 81, Henshaw, Bulkley & Co., San Francisco, Cal., $2900; 208, Tindal, Morris Company, Eddystone, Pa., $2470 and $2910.

Class 61.—For furnishing and installing one crane and seven trolleys at Naval Station, North Chicago, Ill.—Bidder 122, Manning, Maxwell & Moore, New York, $1909.50; 146, New Jersey Foundry & Machine Company, New York, $1805; 223, Whiting Foundry Equipment Company, Harvey, Ill., $1505.

Class 82.—One motor driven geared lathe—Bidder 69, Fairbanks Company, Washington, $106.10; 78, Garvin Machine Company, New York, $985; 85, Hendey Machine Company, Torrington, Conn., $1185; 97, J. P. Kemp, Baltimore, Md., $1020; 122, Manning, Maxwell & Moore, New York, $1185; 139, Miami Valley Machine Tool Company, Dayton, Ohio, $392 without motor; 144, Niles-Bement-Pond Company, New York, $1640 and $977.

Employers' Liability in Ohio

Representatives of a large number of leading manufacturing companies in metal working lines in Cleveland appeared before the Employers' Liability Commission during its session in that city October 31 to November 3 to present their views regarding changes that should be made in the Norris-Mathews law that was passed by the last session of the Ohio legislature. A paper on the volunteer accident relief plan of the American Steel & Wire Company was read by S. W. Tener, manager of that department of the company, and other papers were submitted on the subject of employers' liability. While different opinions were expressed regarding various phases of the topic under discussion the general sentiment, as shown during the hearing and in the answers submitted to questions propounded, appeared to be about as follows:

The present employers' liability law of Ohio is grossly unfair. If a general compensation act is to be adopted all the statutes in the State fixing employers' liability should be repealed and any such liability then remaining would be solely upon negligence under the common law.

Measures for the prevention of accidents are of prime importance. Realizing that the prevention of all accidents is impossible there should be a well organized department for the inspection of factories, workshops, mines, &c. This department should be placed under the control of engineers and experts of acknowledged ability, who will employ similar grades of efficiency for the actual inspection service, the whole department to be under civil service regulations and entirely removed from party politics.

There should be a general compensation system with a reasonably regulated schedule of payments for employees injured in accidents. This will be for the best interests of all concerned. Such a plan would have a tendency to diminish poverty and relieve suffering and make for the better citizenship of those who might otherwise be forced upon the community for support. Such a law should be sufficiently general to take in all accidents of trade, except those due to the clear and malicious carelessness of the injured himself. Awards for death benefits should be payable in installments over a period of years instead of in a lump sum, which might soon be dissipated and the beneficial purposes of the law defeated.

In reply to the question as to how the expense of a compensation system should be borne the majority favored having the State pay the cost of administration. A few also wanted the State to bear a portion of the compensation. The general opinion, however, was that the expense, outside of the cost of administration, should be divided between the employer and employee. A few thought the employer should pay it all, and among others considerable difference of opinion was expressed as to what portion should be borne by the employer and what portion by the employee. The opinion prevailed that the State, either through a new or an existing department, should provide general supervision to see that a compensation plan is properly administered, whether it is undertaken by insurance companies, mutual associations or individual employers.

Cleveland and Cuyahoga County have been selected by the Employers' Liability Commission as a field in which to conduct an extensive investigation regarding the number, causes and settlement of industrial accidents. E. E. Watson, who recently conducted a similar investigation in Illinois, will be in charge of the work and will be aided by a corps of assistants. This investigation has started and will continue for six weeks.

Top Furnace of the Wheeling Steel & Iron Company, Wheeling, W. Va., was out of blast three weeks in October for repairs.

Ore Dock Construction Halted

Allouez Bay Extension Waits—Curtailment at Iron Mines

MARQUETTE, MICH., November 5, 1910.—As to the outlook in Lake Superior iron mining for the year to come, little can be said at this time. Conditions do not appear as promising as at this date in 1909; nevertheless it is the opinion that some improvement will appear in the coming months. Rather more ore in stockpiles is being carried over than was the case last fall, and while some underground mines are closing along with the open pit properties, which usually suspend at this time, it is believed that fully as much development work will be conducted as during last winter. Probably a dozen new mines are being opened on the old ranges, and even more than that number on the Mesaba. Steam shovel work in the latter region is continuing at its customary heavy rate, and as far as at present known there will be no more than the curtailment in this work of stripping usual in the winter season.

While because of its ore haulage contract with the United States Steel Corporation, the Great Northern railroad will show an increase in its Mesaba range shipments next season, the gain, it is expected, can readily be handled with present facilities. For that reason construction work on the new dock of steel and concrete at Allouez Bay, Superior, will not be pushed. The steel is being stored, in fact, and operations shortly will be suspended for the winter. For a similar reason, extensive contemplated improvements in the ore yards at Allouez will not be taken up until next summer. These include a change in the grade to the docks and the erection of a storage house, a round house and other structures.

The Soo Line is making good progress with the construction of its ore dock at Superior. The pier will be in readiness well before the opening of the next shipping season. The most of the required 8000 piles have been driven and work on the superstructure is about to start. The Soo Line will serve the new Cuyuna range. The company was in the ore hauling business to some extent years ago, having a small dock at Gladstone, Mich., to which ore was hauled from the Menominee range. Its Wisconsin Central division serves a number of Gogebic range mines, its docks being at Ashland.

Output Reduced on Old Ranges

Corrigan, McKinney & Co., of Cleveland, have a very considerable amount of ore in stock at their Great Western mine in the Crystal Falls district, and the mine has been closed down. The workings are permitted to fill with water, which is taken to indicate that the suspension will be of considerable duration. Only recently Corrigan, McKinney & Co. stopped work at their Colby and Ironton mines on the Gogebic range. Their Kimball, Fairbanks and Crystal Falls properties in the Crystal Falls district also are inactive, and the big Stevenson open pit on the Mesaba range has filled its contracts for the season. Not all the company's mines are idle, however, and some new ore deposits are being opened. While the Great Western is out of commission, an addition to the engine house will be built and all machinery put in first-class condition.

Operations at Oglebay, Norton & Co.'s Bristol mine at Crystal Falls, have been materially curtailed, whereas nearly 400,000 tons of ore was produced in 1909, only about 300,000 tons will cover the output this year. From all its properties on the Menominee range the company is sending out this season somewhat more than 500,000 tons. Next to the Bristol, the largest shipper is the Berkshire at Stambaugh, with 100,000 tons. The new Buckeye at Commonwealth has a record of 90,000 tons, and the Chatham at Stambaugh of 60,000 tons. The Buckeye will carry over in stock some 25,000 tons of ore. The deposit at this property appears to be a large one, but it is of low grade. Oglebay, Norton & Co.'s Empire mine on the Marquette range is about to suspend operations, but this is to be expected, it being in part an open pit operated on the milling system.

The Buffalo & Susquehanna company's Hiawatha mine at Iron River, Menominee range, has wound up its season's shipments at 130,000 tons. The Spring Valley Iron Company's new Zimmerman property in the nearby Palatka field likewise has completed its year's quota. A force of 50 men will be employed in development work at this mine throughout the winter, and much new ground will be opened. A great deal of exploration is in progress in both the Iron River-Stambaugh and Crystal Falls districts. The drilling extends over more than twenty-five miles of country.

New Concrete Shafts

The Cleveland Cliffs Iron Company is making excellent progress with the construction of the new shaft at the Negaunee mine, Marquette range. The concrete lining has been put in to a point nearly 500 ft. below the surface. Instead of being sunk, this shaft was raised to surface, the operations starting from a drift driven from the older workings of the mine. The opening is now being enlarged, this work starting from surface, and as the rock is being cut out the walls are being concreted to a thickness of 14 in.

The concrete shaft which the New York Foundation Company has been sinking at the Morton mine on the Mesaba range is now practically completed and shortly will be turned over to Tod, Stambaugh & Co., Cleveland. The shaft, one of the largest of its kind, is 180 ft. in depth and 28 ft. in diameter. More than a year was required to get it through the treacherous overburden of sand, water and boulders and firmly to anchor it in the rock ledge. The cost is said to have approximated $250,000. The Morton contains a very large deposit of ore, and the mine is destined to rank among the most important of the Mesaba range underground producers.

An important deal involving Cuyuna range, Minnesota, property has resulted in the Rogers-Brown interests securing control of the Weyerhaeuser eighty in Section 11, 46-29. The tract is believed to contain a large ore body, and it has been sought by various interests. Adjoining it on the west is the Interstate mine, where a concrete shaft is being sunk, while on the east side is the Keating forty, with its high grade ore. To the northeast is the Neimeyer forty, where the Armour concrete shaft has been completed, the Chisholm & Williams ore body, and the property of the International Harvester Company. To the west also are the Feigh holdings, leased to the Hill Lumber Company of Saginaw, and to the northwest the ore bodies in the Gross and Hopkins and Jeune lands—all seemingly on the same iron formation.

Lake Superior Ore Shipments in October

The shipments of Lake Superior iron ore in gross tons from Upper Lake docks in October, 1910, and up to November 1, are given below, with corresponding figures for 1909:

	October, 1910.	October, 1909.	To Nov. 1, 1910.	To Nov. 1, 1909.
Escanaba	639,444	928,175	4,507,517	4,930,971
Marquette	309,283	528,195	2,998,503	2,507,712
Ashland	380,830	714,271	3,817,669	3,136,275
Superior	1,317,902	1,003,956	7,802,254	5,747,454
Duluth	1,223,710	2,092,861	13,089,262	11,850,038
Two Harbors	1,006,268	1,448,843	7,763,103	8,092,884
Totals	4,877,441	6,625,801	39,978,308	36,265,334

The percentage of the total going over Superior docks has increased this year, being 19.52 to November 1, against 15.85 to the same date last year. Two Harbors shows a falling off from 22.32 to 19.42. Duluth's percentage is practically the same—32.74 this year, against 32.68.

The British Steel Industry

Its Outlook in the Light of Developments in Other Countries

William Clark of the Steel Company of Scotland made the presidential address at the annual meeting of the West of Scotland Iron and Steel Institute, held at Glasgow October 21. Reviewing the progress of iron and steel manufacture in Great Britain, he compared its expansion with that in the United States and Germany. He considered that one reason for the lower cost of production in Germany and Belgium than in Great Britain was that in the former countries longer hours are worked. The protection enjoyed by Germany and other countries, enabling them to take export orders at lower than domestic prices, he considered another cause of their relatively faster advancement in iron and steel. Some of the British works, he admitted, being pioneers in their line, are now somewhat antiquated; but he considered it a matter of gratification to know that extensions and remodelings are now going on on a large scale, particularly in the Midlands, and that a number of works have been put in condition to compete with the low price of Continental steel. The portion of the address discussing the future and the factors that will more and more enter into international trade in iron and steel is as follows:

The Outlook

The outlook for the steel industry, not alone of Scotland, but of Great Britain, is one that requires serious consideration. Manufacturers here are gradually, but surely, losing markets in different parts of the world which have formerly taken large quantities of steel from our shores. Japan is now manufacturing largely for her own requirements, and trade with that country will gradually disappear. Further, while it may be many years before Japan is in a position to compete for the outside requirements of the world, that day will surely come. The requirements of China have, to a large extent, been supplied by this country; but this is likely to cease in the course of time. The Hanyang Iron & Steel Works were started about the year 1890 to provide rails for the Pei Han Railway. Like all new ventures it had many vicissitudes, but it is now, and has been for some years, a factor to be reckoned with in the steel producing world. They have a rich and abundant supply of ore in the Tayeh district, 75 miles from the works, situated on the Yangtse River. The ore assays about 65 per cent. iron, and is said to be of excellent quality. The coal and coke come from the Pinghsiang Mines in Kiangsi Province, 250 miles from the works. This company has been supplying the Japanese Government Steel Works with ore from the Tayeh mines, and has also been shipping Bessemer hematite pig into San Francisco at a cheaper rate than the works in the Eastern States of America could supply it.

The Labor Factor

I mentioned as one of the reasons why Great Britain had fallen behind in her production of steel, as compared with some of our Continental competitors, the higher wages paid in this country for some classes of labor. The wages, however, paid in China for all classes of labor are so much lower than what is known even in the most poorly paid districts of the Continent, that in considering these we readily perceive what serious competitors they may become, especially in our oversea trade. According to an article which appeared in *Chambers' Journal* for July, "the works are now turning out fully 500 tons of pig iron and 250 tons of rails per day, and it is expected this output will be more than doubled when the plant in course of erection has been completed." The article goes on to say: "Labor both at the river side and at the works is cheap. The coolies engaged in loading and unloading the ore work for 3 pence per shift, while at the works wages vary from 5 pence per day for unskilled to 5 shillings per day for skilled furnacemen and mill hands; the average may be taken at about 1 shilling 3 pence per day." These facts call for serious consideration. The wages paid on the Continent of Europe are more likely to appreciate than depreciate, and China and Japan cannot hope for many years to emulate our army of highly trained engineers, chemists and workmen; but it is the duty of all these to see to it that no effort is spared on their part to maintain and extend our position in the steel producing world. There is much yet to learn. The call of the engineer is ever for something better. Britain has hitherto been in the forefront where the best and most reliable material was to be had, and if she continues to lead in the matter of quality we need not fear but that there will ever be a market open for the best.

The Direct Process and Various Economies

There are many schemes at present engaging the attention of manufacturers for the cheapening of the cost of production. It has long been the desire of the scientist to produce steel and iron direct from the ore. In 1873, at the Steel Company of Scotland's Works, furnaces were erected by Sir William Siemens, and good puddle ball was produced direct from Tharsis purple ore, but the cost was much in excess of the indirect method of manufacture, so the furnaces were dismantled. There have recently been several methods put forward to accomplish this desirable end; should any of them prove successful, it would probably revolutionize the steel and iron making industry. Recently I saw some iron said to have been made by a direct process and at a price that would mean a revolution in the manufacture of iron and steel. Unfortunately, the process is not yet perfected and cannot, therefore, be further discussed at present.

The recovery of the by-products from producer gas has not made the progress it should have made if the claims of its promoters are correct. This should not be in the region of doubt, but be clearly open to demonstration, seeing it has now been in operation at several places for some years. There is no doubt as to the efficiency and reliability of the gas engine, which is exclusively at work in many large plants in the country, and this being so there is the greater need for a forward movement being made with the recovery of the by-products from producer gas.

The exhaust steam turbine has achieved the success the pioneers predicted for it, and is now introduced into many large works where exhaust steam is available. Another advance has been made in the introduction of the mixed pressure turbine which is suitable for either high pressure steam or exhaust steam.

The adoption of electrically driven mills is making steady progress, and some of the very large works in England have adopted this method with satisfactory results, and further plants are in course of erection. The power is obtained from the surplus gas from the blast furnaces, which is used in gas engines generating the electric energy necessary to drive the mills. The engines are, in like manner, supplying the necessary power to free the air used in the blast furnaces from moisture, with good results so far as the blast furnace is concerned.

Improvements at Michigan Charcoal Furnaces

The Lake Superior Iron & Chemical Company is spending $350,000 in construction work at Newberry, Luce county, Mich. A retort plant, an acetate of lime works and a sawmill are being erected, as are various buildings to be devoted to auxiliary uses. The retort plant will occupy a building 72 x 300 ft., besides cooling houses, and will necessitate the construction of five miles of railroad tracks in the yards. The sawmill will have a capacity of 60,000 ft. a day.

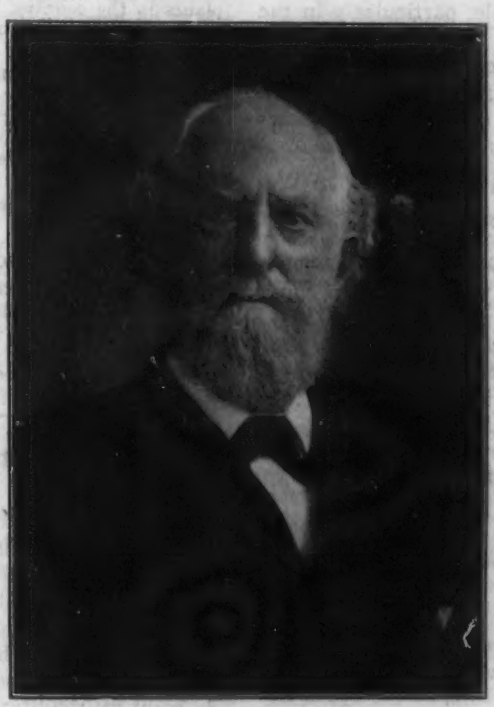
The Lake Superior Iron & Chemical Company is also making extensive improvements at its plant at Manistique, Schoolcraft County, Mich. These include a steel and brick boiler house, 47 x 140 ft., a machine shop of the same dimensions, a sand house, 28 x 60 ft., and an addition to the engine house. The smokestack, one of the largest in Upper Michigan, will be 158 ft. high, 13½ ft. in diameter at the base and 9 ft. at the top, and will be of reinforced concrete.

Pittsburgh Steel Company Blast Furnaces.—Reports in the daily press to the effect that the Pittsburgh Steel Company, Pittsburgh, operating an open hearth steel plant and wire rod and wire mills at Monessen, Pa., had decided to build four new blast furnaces are premature. It is true that the company has under consideration the building of two or more blast furnaces in order to supply its own pig iron, which is now bought in the open market, but a definite decision has not yet been reached, although it probably will be shortly. The company is having a heavy demand for its wire products and for its Pittsburgh Perfect steel fencing. To meet this heavy demand, which involves at all times an ample supply of pig iron, blast furnaces are needed.

Death of Philip Corbin

Philip Corbin, New Britain, Conn., president of the American Hardware Corporation and founder of the great business of P. & F. Corbin, died November 3, aged 86 years. He was born in Willington, Conn., October 26, 1824. The son of a farmer, he attended district school and helped his father, and occasionally worked for other farmers in the neighborhood. His education ended when he had completed a term and a half at the West Hartford Academy. After he was 15 he spent but little time at home, but worked for other farmers. At that time there was no farm machinery and men worked in crews or gangs, the best man setting the pace for the others. His strength and the cheerful spirit with which he worked made him especially valuable as a pace maker, and his services commanded a premium over ordinary wages.

Mr. Corbin abandoned farm life in 1844, when he went to New Britain, entering the factory of Matteson, Russell & Co., now the Russell & Erwin Mfg. Company. It was then customary for the manufacturers to have their goods made upon yearly contracts by men who engaged their own labor, and Philip Corbin worked for such a contractor, receiving $14 per month in wages. To add to his earnings, he did such other work as he could obtain, outside the regular hours of labor, among other things sweeping out the factory once a week for 50 cents. A few months later he went to the North & Stanley factory, also in New Britain, working for a lock contractor, and, quickly mastering the trade, was himself a contractor before he was 21, with 19 men in his employ. Until he attained his majority, Mr. Corbin gave his father all his earnings aside from the amount required for his support, and in the last year of his minority the sum thus paid was fully $1000.



PHILIP CORBIN.

In 1848 Mr. Corbin formed a co-partnership with his brother Frank, and a brass founder, Edward Doen, under the name of Doen, Corbin & Co., to manufacture hardware, each contributing $300. Securing land and a building, a horse and tread mill were installed to supply the power to the two lathes, grindstone and emery wheel which composed the equipment. In May, 1849, work was begun, and the first shipment of goods —brass ox balls—was made July 4. Mr. Corbin usually began work at daylight and often as early as three o'clock in the morning, and performed in each day work which would have cost from $6 to $7 to hire done at the prevailing rate of wages of $1.50 per day. He also kept the books and conducted the correspondence. His tireless energy and great vitality enabled him to perform herculean tasks without impairment of health, and it is worthy of note that despite the hardships and overwork of the early years of his career he survived every one of the men with whom he did business at that time. In the same year he married. Henry W. Whiting, Mrs. Corbin's father, bought Mr. Doen's interest a few months later, and two years afterward Mr. Whiting disposed of his share to the two brothers, and the firm became P. & F. Corbin, a name which has become famous the world over.

In 1851 American manufacture was in its infancy, and nearly all the hardware was imported. Mr. Corbin avoided domestic competition by confining his product to articles made abroad, and as they were better made than the imported goods he found a ready market. It was at this time that he formed his policy of making goods of a superior quality and a complete assortment in any line he adopted. He was thus able to meet all demands in any field he entered. In 1854 it was found desirable to incorporate in order to secure increased capital. Philip Corbin was made secretary, and continued in the management; in 1859 he was elected treasurer, and at the death of F. H. North, one of the new stockholders at the incorporation, was chosen to succeed him as president of the corporation. In 1858 Andrew Corbin joined his brother and in 1860 took charge of the New York office, returning to New Britain in 1872 to become general manager of the factory and first vice-president.

In 1882 the Corbin Cabinet Lock Company was organized to take over that department of the business. The American Hardware Corporation was formed in 1902, consolidating the business of P. F. Corbin with the Russell & Erwin Mfg. Company, Philip Corbin being made its president. The Corbin Screw Corporation was organized in 1903, and the same year the Corbin Motor Vehicle Corporation was founded. Mr. Corbin was active in other industrial and financial enterprises and was president of the New Britain Machine Company, the Porter & Dyson Company, the Savings Bank of New Britain (to save which he risked his entire private fortune), and other corporations.

He was prominent in the Congregational Church; had been president of the New Britain Club and the Maple Hill Golf Club; served in various town offices when the services of good men were required and was a member of the State Legislature in 1884 and of the State Senate in 1888.

Of a family of ten, three survive him—a brother, Elbert A. Corbin, and two sisters. His son, Charles F. Corbin, his son and daughter and a grandson, are the only direct descendants. Mr. Corbin's wife died in 1909.

Mr. Corbin's business career is unique in that it covered a period of 66 years of active life, of which 61 years were spent in the management and development of a single enterprise engaged in the manufacture of hardware. The capital invested has grown from $900 to $10,000,000 and the number of persons employed from 3 only to 10,000. To the nation at large Mr. Corbin is known as a great industrial leader. To his townspeople and others who came to know him personally there is added a warm appreciation of his individuality, which was in many ways unusual, even in New England, where the stern struggle for existence aided in the development of the character of the people of Mr. Corbin's time. He was dignified, with the dignity that came from a self-respect that exacted more from himself than it required from others. Approachable, the door to his office was open to every employee of his companies. He avoided ostentation and resisted any attempts to force him into undue prominence.

With an opportunity to amass a great private fortune, he chose to draw from his companies a modest salary and to turn back into the business the increment it created. The extent of his benevolence will never

be known, for though he gave liberally he sought avenues for his benefactions which kept them unknown except to those directly concerned. He never forgot a friend and rarely made an enemy, and to those whom he trusted he gave his entire confidence in a manner which bound them to him.

Personal

A. C. Hanna, formerly secretary of the Dominion Wire Company, Montreal, has gone to Winnipeg as sales manager there of the Steel Company of Canada.

S. M. Hershey, formerly with the Norton Company, Worcester, Mass., has taken charge of the manufacturing department of the Carpenter-Kerlin Gear & Machine Company, 75 White street, New York.

Frank O. Wetmore has been elected one of the directors of the Allis-Chalmers Company to succeed William W. Allis, retired. All the other directors were re-elected.

John Lambert and Harry Bronner have been elected members of the Executive Committee of the Republic Iron & Steel Company, succeeding L. C. Hanna and E. W. Oglebay, who have resigned. Mr. Bronner is a member of the New York banking and brokerage firm of Hallgarten & Co. The Executive Committee now consists of John A. Topping, chairman; John W. Gates, Grant B. Schley, Harry Bronner and John Lambert.

Thomas M. Kennedy of the purchasing department of the Lane Bros. Company, railroad and general contracting, Altavista, Va., has been transferred to Jackson, Ky., to take charge of a storage warehouse for the same concern, and will have charge of the purchasing of all supplies for the contract which the company has recently secured there. Mr. Kennedy's successor at Altavista will be J. P. Thompson, recently with the Virginia Soapstone Company of Albemarle County, Va.

Gulf Coast Commercial Matters

MOBILE, ALA., November 3, 1910.—One of the largest and most representative gatherings of business men of Florida and southern Alabama assembled in years attended a recent session at Pensacola, of the board of army engineers for rivers and harbors who are looking into the project of a canal from Pensacola to Mobile Bay, which it is estimated will cost about $1,000,000. The board was headed by Col. William T. Rossell. Addresses were delivered and statistics presented showing the benefits to be derived, it being estimated that the annual saving on coal, cotton and iron exported from Birmingham and contiguous districts would exceed a quarter million dollars in freight rates and also furnish transportation facilities to Baldwin County, Ala., which now has a very limited means of getting products to market.

Birmingham's coal business this year will be by far the greatest in the history of the district, the Western miners' strike and the low stage of the Ohio River, which prevents Pittsburgh coal from reaching New Orleans, having caused enormous demands to be made on the Birmingham district this year.

At the concluding session at Beaumont, Texas, of the Intercostal Inland Waterways League it was decided to especially strive for the construction of an intercostal canal not less than 9 ft. in depth and with a bottom width of 100 ft. or more, to extend from New Orleans on the Mississippi River to Brownsville, Texas, on the Rio Grande, and in furtherance of the project the secretary of the organization, who was made a salaried officer, was instructed to devote his time principally to its accomplishment. At this meeting New Orleans was indorsed as the logical point for holding the Panama exposition in 1915.

The Merchants' and Manufacturers' Progressive Union of New Orleans announces that the Guatemala Northern Railroad has finally acceded to the bureau's position that rates be given on merchandise in carload lots. Up to the present it was immaterial whether shipments were in carload lots or less, the rates being the same, but now that the rate concession has been granted every business concern in New Orleans trading with the tropics will have an opportunity to exploit its Guatemalan trade. A.

Obituary

LYMAN CORNELIUS SMITH, Syracuse, N. Y., died November 5, aged 50 years. He was born at Torrington, Conn., and was engaged in the livestock commission business until 1875. In 1877 he took up the manufacture of breech loading firearms, and in 1890 organized the Smith Premier Typewriter Company, of which he was president until it was sold to the Union Typewriter Company. He was a vice-president and member of this company until 1903, when he resigned, and, with his brothers, organized the L. C. Smith & Brothers Typewriter Company and was elected its president. He was also president of the Hudson Portland Cement Company, United States Transportation Company, L. C. Smith Transit Company, Rochester, Syracuse & Eastern Railroad Company and the National Bank of Syracuse; a director of the Halcomb Steel Company, vice-president and treasurer of the Toledo (Ohio) Shipbuilding Company and vice-president of the Board of Trustees of Syracuse University. In 1900 he gave to that university the Lyman Cornelius Smith College of Applied Science.

LOUIS C. TAYLOR, purchasing agent of the John A. Roebling's Sons Company, Trenton, N. J., died October 27.

W. BURNET EASTON, president and treasurer of the International Boiler Works Company, Stroudsburg, Pa., died suddenly November 5. He had been president of the company since its incorporation 12 years ago.

The gray iron foundry department at the Pottstown, Pa., plant of Stanley G. Flagg & Co., Philadelphia, Pa., was badly damaged by fire November 4. The building, which was a frame structure, was entirely destroyed, as was some of the machinery. The blowers and cupola, however, were not seriously damaged. Molding will be resumed in one of their other foundry buildings in a few days, so that little delay in the execution of orders is anticipated. The loss was approximately $10,000.

The commission on employers' liability and workmen's compensation for accidents, appointed by the Governor of Massachusetts, had a public hearing at Boston last week. A number of manufacturers were present, and they will be given a further opportunity later this month to indicate their views on the legislation proposed. Meanwhile the commission is to visit a number of other cities in carrying on its investigations. It is instructed to report a bill by January 4, 1911.

The Petroleum Iron Works Company, Sharon, Pa., has secured an order from the Republic Iron & Steel Company for two 11½ x 250 ft. stacks for the works at Youngstown, Ohio; also 750 tons of tankage from the British West Indies. Its shops are running full on work for various concerns in the United States and Mexico.

Production of Wire Nails and Cut Nails in 1909

The American Iron and Steel Association has just published detailed statistics of the production of iron and steel cut and wire nails in the United States in 1909.

Cut Nails

The statistics for iron and steel cut nails and cut spikes embrace only standard sizes of nails and spikes cut from plates. They do not include railroad and other forged spikes, wire nails of any size, machine-made horseshoe nails, cut tacks, or hob, clout, basket, shoe or other small sizes of nails. Cut spikes are always included with cut nails. The production in 1909 amounted to 1,207,597 kegs of 100 pounds each, against 956,182 kegs in 1908, an increase of 251,415 kegs, or over 26 per cent. The following table gives the production of cut nails and cut spikes by States in 1908 and 1909 in kegs of 100 lb., iron nails being separated from steel nails for 1909:

	1909.			1908.
	Iron.	Steel.	Total.	Total.
Pennsylvania	265,568	401,224	666,792	525,169
West Virginia, Massachusetts and Ohio	.....	364,947	364,947	285,554
Kentucky, Illinois and California	42,120	133,738	175,858	145,459
Totals	307,688	899,909	1,207,597	956,182

In 1909 over 74.5 per cent. of the total production was cut from steel plate and a little less than 25.5 per cent. from iron plate, while in 1908 over 67.5 per cent. was cut from steel plate and a little less than 32.5 per cent. from iron plate. The maximum production of iron and steel cut nails and cut spikes was reached in 1886, when 8,160,973 kegs were made. Thirteen works in six States made cut nails in 1909, as compared with 14 works in seven States in 1908. Eight works were idle in 1909. The following table gives the production in kegs by States of cut nails from 1906 to 1909:

	1906.	1907.	1908.	1909.
Pennsylvania	657,836	664,998	525,169	666,792
West Virginia and Indiana	208,935	175,549	285,554	364,947
Massachusetts and Ohio	114,400	102,333		
Kentucky, Illinois and California	208,068	166,258	145,459	175,858
Totals	1,189,239	1,109,138	956,182	1,207,597

In 1909 our exports of cut nails and cut spikes amounted to 22,256,458 lb., or 222,565 kegs of 100 lb., against 15,731,898 lb., or 157,319 kegs, in 1908. Our imports of cut nails and cut spikes are only nominal.

The production of iron and steel plate for the manufacture of cut nails and cut spikes in 1909 amounted to 63,746 tons, against 45,747 tons in 1908, an increase of 17,999 tons, or over 39.3 per cent. Of the total in 1909 about 47,822 tons was steel and 15,924 tons iron, against 30,265 tons of steel and 15,482 tons of iron in 1908, an increase in steel nail and spike plate of 17,557 tons and in iron nail and spike plate of 442 tons.

Wire Nails

The production of steel wire nails in 1909 amounted to 13,725,053 kegs, of 100 lb., as compared with 10,662,972 kegs in 1908, an increase of 3,062,081 kegs, or over 28.7 per cent. The maximum production was reached in 1909. The year of the next largest production was 1904, when 11,926,661 kegs were made. The following table gives the production by States in 1908 and 1909 in kegs of 100 lb.:

	1908.	1909.
Massachusetts, Rhode Island and Connecticut	184,170	195,298
New York, New Jersey and Pennsylvania	4,214,681	6,113,353
Kentucky, Georgia and Ohio	2,787,140	3,470,001
Indiana and Illinois	2,812,105	3,258,106
Wisconsin and Colorado	714,876	688,295
Totals	10,662,972	13,725,053

The wire nails produced in 1909 were made by 44 works in 13 States, as compared with 41 works in 13 States in 1908. In 1909 there were five idle wire nail plants, against 14 in 1908. A number of plants were abandoned in 1909.

Our exports of wire nails in 1909 amounted to 68,668,654 lb., or 686,687 kegs, against 59,381,946 lb., or 593,819 kegs, in 1908. We import very few iron or steel wire nails.

September Exports and Imports of Iron and Steel

The September report of the Bureau of Statistics of the Department of Commerce and Labor shows a decrease in both exports and imports of iron and steel. The total value of the September exports of iron and steel and manufactures thereof, not including iron ore, was $16,776,178, against $17,628,538 in August. The value of similar imports in September was $2,680,369, against $3,473,636 in August.

The exports of commodities for which quantities are given totaled 106,781 gross tons in September, against 130,877 tons in August, 128,055 tons in July, 120,596 tons in June, 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for September and for the nine months ending with September are as follows compared with the corresponding periods of the previous year:

Exports of Iron and Steel.

	September.		Nine months ending September,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	12,997	2,862	83,862	40,837
Scrap	1,915	1,437	16,867	23,487
Bar iron	1,621	784	14,928	9,721
Wire rods	1,044	1,230	16,897	10,671
Steel bars	1,039	6,651	78,934	51,372
Billets, blooms, &c.	4,480	10,475	14,162	94,594
Steel rails	20,538	23,475	263,782	180,784
Iron sheets and plates	7,878	6,117	77,008	50,950
Steel sheets and plates	16,615	10,973	127,648	73,871
Tin and terne plates	808	610	8,394	6,825
Structural iron and steel	10,333	7,473	114,552	68,433
Wire	6,801	3,743	67,750	60,046
Barb wire	5,953	4,233	64,635	49,148
Cut nails	661	772	5,370	6,898
All other, including tacks	1,138	538	7,408	5,837
Pipe fittings	12,960	13,830	118,100	112,965
Totals	106,781	95,206	1,080,297	855,429

The imports of commodities for which quantities are given totaled 30,960 tons in September, against 36,878 tons in August, 42,326 tons in July, 31,010 tons in June, 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of the imports of such commodities for September and for the nine months ending with September are as follows compared with the corresponding periods of the previous year:

Imports of Iron and Steel.

	September.		Nine months ending September,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	16,668	12,601	176,615	90,823
Scrap	3,186	9,886	65,457	14,263
Bar iron	2,508	1,717	31,211	11,662
Billets, bars and steel forms, n.e.s.	3,919	1,434	36,026	11,853
Sheets and plates	704	432	5,465	2,657
Tin and terne plates	2,719	4,346	53,801	44,388
Wire rods	1,256	941	15,779	9,547
Totals	30,960	31,357	384,354	194,193

The imports of iron ore in September were 208,892 gross tons, against 282,949 tons in August, 248,810 tons in July, 193,415 tons in June, 240,833 tons in May, 206,135 tons in April this year and 164,613 tons in the month of September, 1909. The total importations of iron ore for the nine months ending with September were 1,999,917 gross tons, against 1,119,331 tons in the

corresponding period of last year and 482,908 tons in the corresponding period of 1908. Of the September imports of iron ore 118,650 tons came from Cuba, 32,499 tons from Spain, 11,913 tons from Sweden, 11,692 tons from Canada and 34,138 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the nine months ending with September was $146,924,302, against $113,920,860 in the corresponding period of last year. Similar imports were respectively $30,439,703 and $20,879,982.

Aluminum Welding and Brazing

André Beltzer, chemist-engineer, furnishes the following interesting description of a new aluminum welding and brazing process:

The development of the aluminum industry has been handicapped, up to the present, by the fact that no satisfactory and cheap method was known to weld or to braze this most useful metal. With the flux and special brazing sticks which the General Welding Company, 355-357 Fourteenth street, Hoboken, N. J., offers now to manufacturers, it is possible to weld and braze aluminum sheets easier and cheaper than to weld steel sheets of the same thicknesses.

The Welding Process

The process of welding aluminum consists simply in heating the two edges of the sheets up to their melting point with the blowpipe, and then melting in the joint an aluminum wire previously dipped in the flux. The welding is accomplished very rapidly, in one-third to one-fourth of the time required for iron welding. Absolutely no skill is required as in steel welding, and the success of the work does not depend upon the skill or care of the welder. The reason is that in welding steel the welder will carelessly add molten metal on metal that is not yet melted, and although the joint will appear to be good, there will be no weld. On the contrary, with aluminum the drop from the wire will stick to the metal only when the metal below is molten, and the weld is then assured.

For welding aluminum it is necessary to use some kind of oxy-gas flame such as oxy-acetylene, oxy-benzine, or oxy-illuminating gas. But the work is more easily and more quickly accomplished with the oxy-illuminating gas flame, which has a more moderate and widespread heat.

In many cases, welding aluminum sheets will not be satisfactory, because the heat required for melting aluminum will warp the sheets and distort the parts to be welded. Also, it is practically impossible to weld very thin sheets, say No. 20 gauge and thinner. It is then necessary to join the aluminum sheets at the lowest possible temperature. This problem is solved by using the special brazing sticks offered by the General Welding Company, which melt at 350 degrees, the melting point of aluminum being 657 degrees. This process must not be confused with the numerous aluminum processes now on the market. It is entirely different.

The Brazing Process

The operation of brazing consists simply in heating the two edges with the flame until the flux melts by the heat of the piece itself; then the stick is melted in between the two edges. The operation is even more simple than the soldering of two pieces of galvanized sheets. The brazed joint is as strong or even stronger than the metal itself. This process is recommended for the manufacturer of aluminum cooking utensils and containers of all kinds and shapes.

It is often difficult to reach the melting point of an aluminum casting or alloy without warping the piece and also without developing new cracks in the casting. In using the brazing sticks, (melting point at 450 degrees), specially recommended for brazing aluminum alloys, it is a simple matter to repair broken castings or those having blow-holes or shrinkage cracks. The shape of the casting will not be changed, and no new cracks will develop in the casting during or after the brazing operation. It must be noted here also that the brazed joint is as strong if not stronger than the actual metal itself. The method of brazing castings is the same as for brazing aluminum sheets.

For brazing castings the oxy-illuminating gas flame is recommended, but if the parts are small any source of heat (gas and air flame, gasoline-air, &c) is sufficient.

The Remelting of Aluminum Scrap Without Loss

The General Welding Company also offers to aluminum foundries a very interesting deoxydation product to remelt aluminum scrap without loss. The metal thus obtained is pure and homogeneous and has exactly the same properties as the original metal. The scrap, whether of aluminum sheets or castings, is melted in a crucible; then half of a pound to one pound of the compound is added to each 100 lbs. of scrap. Before pouring, the contents of the crucible are thoroughly agitated and the slag is removed. To show the remarkable properties of this compound, aluminum can be recovered even from aluminum foils.

The Charles G. Stevens Company's New Warehouse

The Charles G. Stevens Company, Chicago, has a new warehouse under construction at North Jefferson street and the Chicago & Northwestern tracks. The building is 80 x 150 ft., two stories and basement. It will be used as a "tonnage warehouse" for storing and shipping iron and steel and other materials which are handled by the company in quantities, supplementary to the business now carried on by the company in its new building at Jefferson and Monroe streets.

The company's general office is located in the Monroe street building, and two floors are used for the storage of the general stock. An ingenious racking system has been adopted, which enables a large variety in sizes and grades of material to be carried on a small floor space. Bars, tubing, pipe, strips, cold rolled stock, sheets and an almost infinite variety of other material are carried in small quantities, in a "pigeon hole system" of racking, which has been adopted in place of vertical racks. This plan enables the company to give very prompt service in filling orders for unusual sizes or grades of iron or steel. An electric furnace is being installed in the basement for the tempering or heat treatment of tool steels. In this furnace a barium chloride bath is heated electrically to the exact temperature that may be required for the tools to be treated.

The Poole Engineering & Machine Company, Woodberry, Baltimore, Md., has elected the following officers as a result of the recent death of the president, George Poole: President and treasurer, Robert Poole Simpson; vice-president and general manager, Thomas H. Mirkil, Jr. John A. Finney is continued as secretary. As these officers have been connected with the company in responsible capacities for many years its policy will in no way be changed.

The Terry Core Drill Company and the McKiernan Drill Company have consolidated under the name of the McKiernan-Terry Drill Company. The new company will continue to manufacture the various products of both companies, consisting of a full line of rock drills, hammer drills, core drills, coal cutters, sheet pile drivers, compressors, etc. The office of the company is at 115 Broadway, New York.

An Effective Hot Blast Patch

An emergency patch on a bad break around a hot blast valve has proved so successful at the Columbus Iron & Steel Company's blast furnaces, Columbus, Ohio, that a brief description with illustrations is here given. The original flanges on the hot blast connections above and below the bronze valve seat were poorly designed and made of cast iron. After several years of service the flanges on two of the hot blast stoves cracked and began to spread. In spite of carefully placing new bronze valve seats and the liberal use of red lead the blast continued to leak and the broken pieces of the flanges gradually moved more and more out of level. As the flanges were riveted to the casing it would have required a stop of two or three days to make the necessary repairs, as all the firebrick lining of the connections would have to be torn out and then replaced after the riveting was finished.

The construction of the hot blast valve connections is shown in Fig. 1. The upper and lower flanges are about 4 in. apart, and the space between is taken up by the bronze hot blast valve seat, which is so much in the shadow in the photograph that only a part of the lower flange can be seen.

On February 1, 1910, the blast was off the furnace for about five and a half hours for general repairs. New bronze valve seats were placed in the two stoves, the joints being made with red lead as usual. Then the bronze seats were thickly coated with what is commonly known among blast furnace men as "English cement" and the annular space between the top and bottom flanges of the valve seat was nearly filled with "circle" firebrick (made for a 60-in. diameter) bedded in the "English cement." When all the brick were in

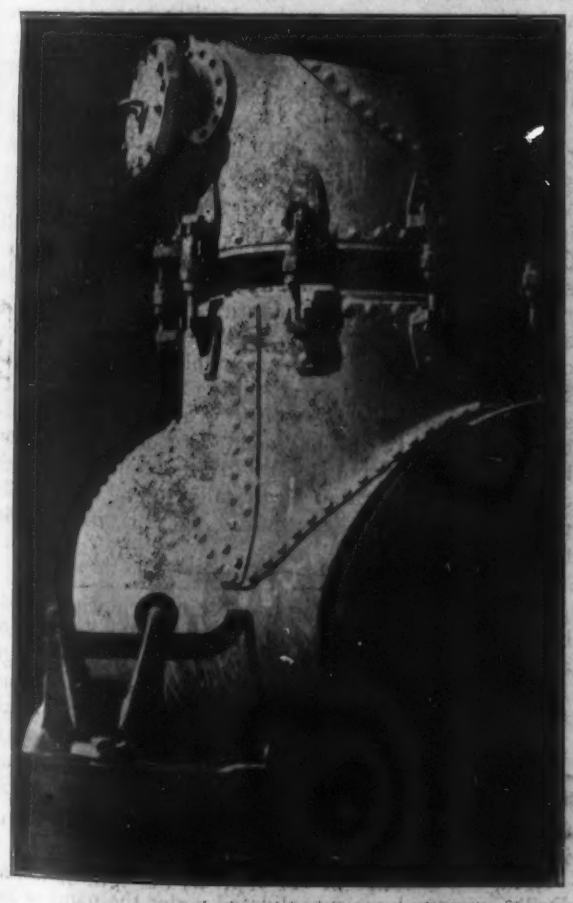


Fig. 1.—The Hot Blast Valve Seat Before Repairs.

place cement was plastered on the outside until there was a solid ring of cement and brick around the valve seat. Fitting tightly outside the cement and brick an iron band ¼ in. thick and 7 in. wide was fastened in place with small bolts. The band was in two sections, and a slot for the water pipes was cut in the proper place. The turnbuckle bolts were then placed in the lugs and drawn tight.

During the eight months that these two patches have been in service it has been necessary to replace one of the iron bands with a band more carefully fitted, the original band having been made out of old material, and also to smear on some fresh cement. Otherwise there has been no trouble in stopping the blast leaks, and the putting on of the new flanges has been postponed until the furnace goes out of blast. The completed patches are shown in Fig. 2. To the right of the two water pipes can be seen one pair of the

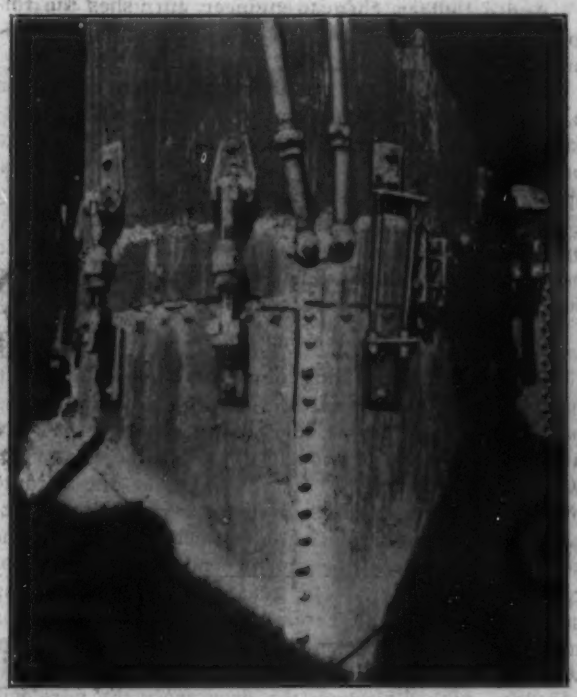


Fig. 2.—The Hot Blast Valve Seat Repaired with Band and Cement.

angle iron flanges with bolts for fastening together the two sections of the band.

Recently the blast leaks around another valve seat were completely stopped by a circle of firebrick set in the "English cement" without having any iron band on the outside. In this case the cement had several hours to harden before the blast pressure was on it. This "English cement" goes under the trade name of "Purimachos cemen." Its properties are especially valuable around blast furnaces because of its resistance to heat and pressure.

Shop Changes Due to the Steel Car.—The *Railway Age-Gazette* refers to the shop side of the steel car era as follows: "The introduction of the steel car in both passenger and freight service is rapidly transforming the equipment of most railroads and gradually changing the character of the car shops and making its impress upon the car department generally. The shops are becoming iron working shops with punches, shears and riveters, and the repair men are no longer carpenters and cabinet makers, but sheet metal workers and blacksmiths. The design of the steel car is more of an engineering problem, and most of the work can be handled better by the machinist or other iron worker than by the old-time car builder or woodworker. It is a remarkable fact, however, that the cabinet maker in the shops of the large passenger car builders has so adapted himself to the fitting of steel sheets, moldings and trimmings that his work is more rapid and accurate than the regular sheet metal workers."

STANDARDS.
PITTSBURGH, PA.

The Hendey Quick Threading Attachment

A Lathe Attachment for Quickly Returning the Carriage

A new attachment for lathes, which, as its name indicates, is designed for rapid thread cutting, has been brought out by the Hendey Machine Company, Torrington, Conn. Its special feature is the saving in time over ordinary methods, which is accomplished by returning the carriage at high speed after each cut until the thread is finished. This is accomplished by the coarse pitch multiple thread quick return sleeve which, together with the chasing sleeve, rotates constantly when the attachment is in use. The length of travel in either direction is governed by automatic trip dogs, and thus no perceptible time is lost when making engagement from one sleeve to the other, which is in great contrast to ordinary lathe work where it is necessary to reverse all the moving parts from the countershaft down. Figs. 1 and 2 show the attachment applied to a lathe when both in and out of use, while Figs. 3 and 4 are front and end views giving details of its construction.

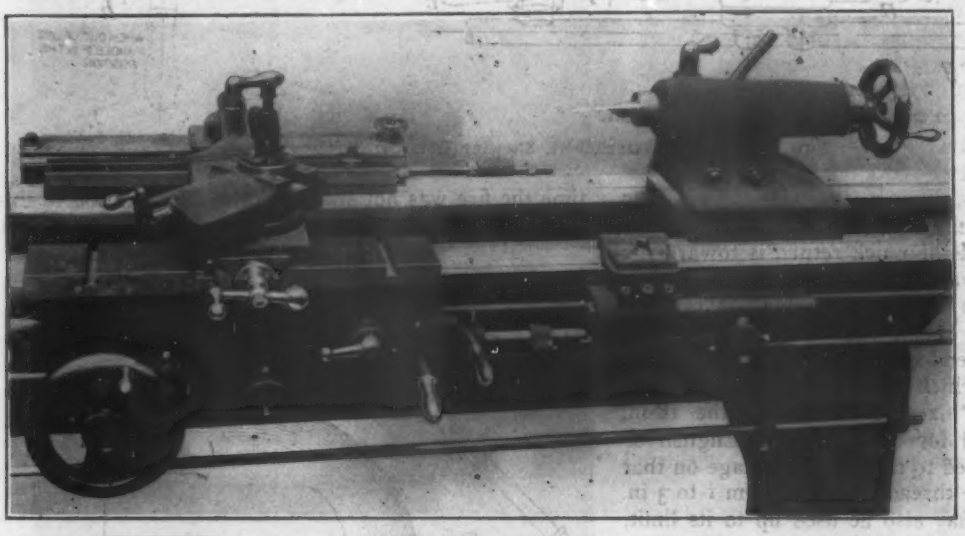


Fig. 1.—The Quick Threading Attachment Made by the Hendey Machine Company, Torrington, Conn.

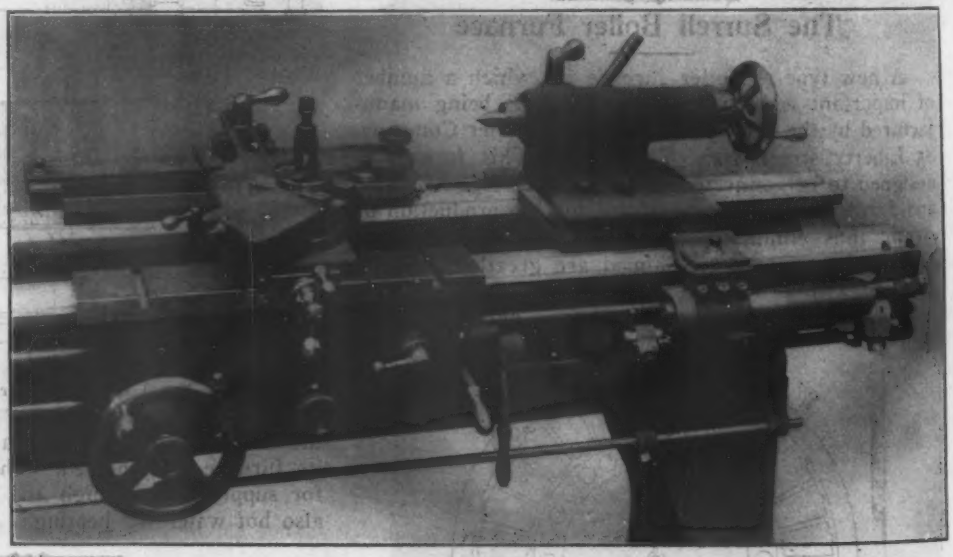


Fig. 2.—View Showing Attachment at End of Lathe When Not in Use.

The attachment has comparatively few parts; seven in all; hence is not complicated. It is clamped against the front V of the lathe and has a sleeve which slips over and is driven by the lead screw. The construction is clearly shown in Fig. 1 where the attachment is mounted on a lathe with the actuating or rocker shaft connected with the bracket on the lathe apron and the guard removed to show the chasing and the reversing sleeves. When not in use the attachment is easily disconnected by removing the knurled head pin connecting the actuating shaft with the lathe apron. The entire attachment, with the exception of the apron bracket and the working lever, can then be moved to the end of the lathe bed as shown in Fig. 2, where it is out of the way.

As shown in Figs. 3 and 4, the two sleeves *a* and *b*, are geared together and rotate at the same speed as the lead screw which passes through the sleeve *a* and drives the attachment. The nuts *c* and *d* engage with these sleeves and are held in the rocker *e* which is connected with the apron by the push shaft *f* through the handle *g* in the bracket *h*. When the slip nut in the apron is thrown out of engagement, the rotation of the lead screw causes the carriage to move in one direction when nut *c* and sleeve *b* are in engagement and very rapidly in the opposite direction when nut *d* and sleeve *a* are engaged. The limits of this travel are determined by dogs which strike stop pins on the bracket *i* and throw the rocker *e* and the handle *g* to the neutral position where neither nut is in engagement.

In using the attachment when cutting a right hand thread, after the gear box has been set for the desired pitch, the regular reverse handle shown at *j* is thrown into the extreme lower position, Fig. 4, and left there. The attachment is clamped tightly to the bed by the screw *k* at a point which will permit the desired amount of travel. The handle *g* is then thrown to the neutral position as shown in Fig. 4. Four dogs are sent with the attachment, two, marked R, for use when cutting right hand threads, and two, marked L, for cutting left hand threads. The first two dogs are slipped on the shaft *f* which is connected to the handle *g* by the taper pin *l* as shown in Fig. 3. The correct position of these dogs *m* and *n* is found by running the carriage by hand to the desired place of stopping and sliding the corresponding dog until it hits the stop pins where it is fastened.

With the carriage at the right or tailstock end and the lathe running, the handle *g* is raised to the cutting position, Fig. 4, and pressure is kept on it until the nut *c* slips into its thread on the sleeve *b*. The carriage will then travel until the dog *m* throws the rocker out of engagement and the handle *g* to the neutral position. After backing the tool out of the cut, the handle *g* is thrown down to the reverse position, and the carriage

travels back rapidly until the dog *n* throws the nut *d* out of engagement with the sleeve *a* and the carriage stops. This process is repeated as often as necessary to complete the thread. When cutting left hand threads the dogs marked L are substituted for the others, and the reverse handle *j* is thrown into the position indicated by the full lines, Fig. 4, and left there. The operation is otherwise the same as for cutting a right hand thread except that the quick return is toward the headstock instead of away from it.

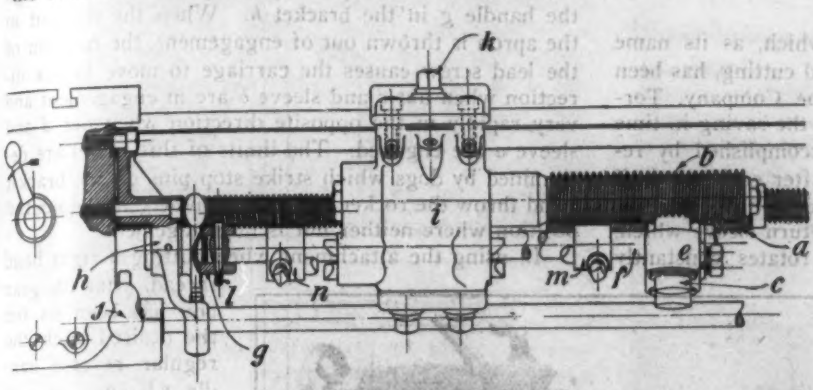


Fig. 3.—Front View of Attachment.

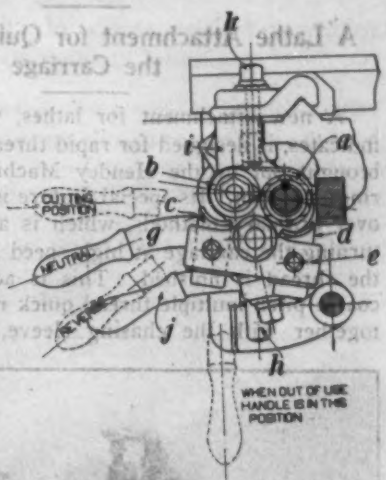


Fig. 4.—End View.

Two Views of the Attachment, Showing Details.

The attachment can be furnished for the maker's 14, 16 or 18 in. lathes of the regular or geared head patterns; it is recommended, however, that the minimum length of bed to which it is applied should be 6 ft. for the 14 and 16 in. sizes and 7 ft. for the 18-in. lathes. It is furnished for cutting either English or metric pitches and is used to the best advantage on that class of work where the thread averages from 1 to 3 in. in length, although it may also be used up to its limit, which is 6 in.

The Surrell Boiler Furnace

A new type of boiler furnace for which a number of important advantages are claimed is being manufactured by the Surrell Double Draft Boiler Company, 85 Liberty street, New York City. This furnace is designed to be connected to an ordinary type of boiler and furnishes the heat necessary for the production of steam, thus eliminating the grate in the old boiler. Among the advantages claimed are greatly increased capacity with a decrease in the amount of coal consumed and freedom from smoke and clinkers in the ash. The furnace is self-stoking and will burn all grades of coal. Fig. 1 is a plan view of the furnace, while Fig. 2 is a sectional elevation through a combustion chamber.

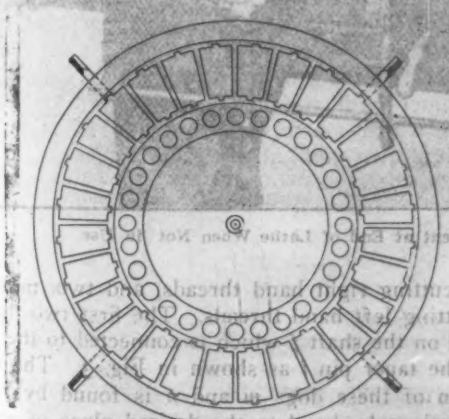


Fig. 1.—Plan View of a New Type of Boiler Furnace Made by The Surrell Double Draft Boiler Company, New York City.

In a recent test made on one of these furnaces in an apartment house in New York City, a fire was started with pea coal at 7 a.m. and a pressure of 5 lb. maintained with all the doors closed until 10 p.m. At that time more coal was put on the fire, and the next morning the steam pressure was 2 lb. Throughout this time the fire was not shaken down. In addition to this furnace for attachment to horizontal tubular boilers,

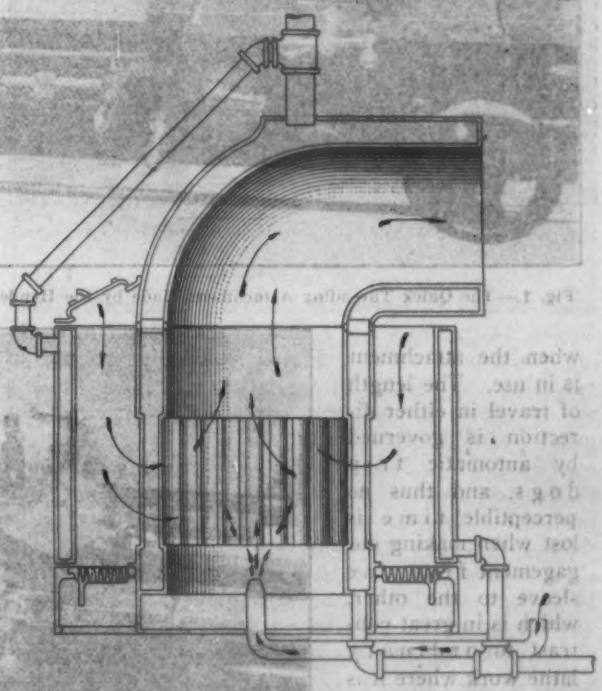


Fig. 2.—Sectional Elevation Through Combustion Chamber.

the company is also building a complete boiler in which its furnace is embodied. These boilers are designed for supplying both high and low pressure steam and also hot water for heating.

Railroad Equipment Orders.—The Pittsburgh, Shawmut & Northern is expected soon to be in the market for 2300 coal cars and 500 box cars. The Jamison Coal & Coke Company has ordered 400 hopper cars from the Standard Steel Car Company, which will also build 15 cars for the Lehigh Valley. An order has been given to the Pressed Steel Car Company for 50 tank cars for the Canadian Pacific. Inquiries in the market include 100 steel ore cars for the Lake Superior & Ishpeming, 100 box and 100 flat cars for the Atlanta & West Point, and 13 coaches for the Seaboard Air Line. The Swift Refrigerator Transportation Company is considering 250 cars, and the Armour Car Lines will build 200 refrigerator cars. The Detroit, Toledo & Ironton has ordered 12 locomotives from the American Locomotive Company, and the Seaboard Air Lines will buy 10 freight locomotives.

The Wilmarth & Morman Lathe Center Grinder

Rapidity and Convenience of Operation Are Its Chief Characteristics

The accuracy of lathe work depends upon the grinding of the centers, and while machinists generally appreciate the importance of keeping the lathe centers ground true, they are nevertheless prone to neglect to regrind them because of the time required with some of the appliances which are used for this work. A grinder for truing lathe centers, which is simple in construction and easily attached to a machine, is now being

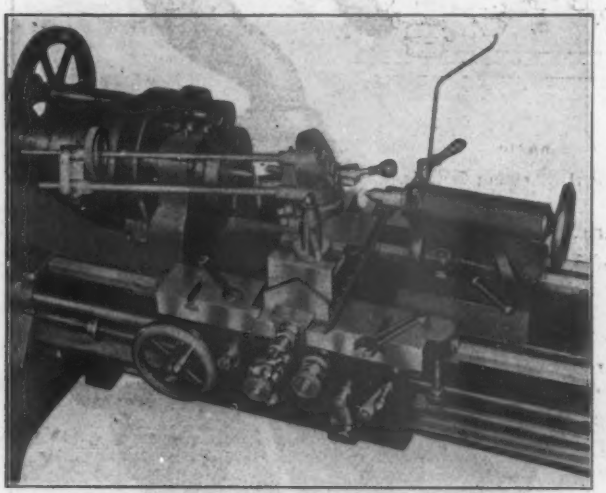


Fig. 1.—The New Lathe Center Grinder Made by the Wilmarth & Morman Company, Grand Rapids, Mich.

made by the Wilmarth & Morman Company, Grand Rapids, Mich. Fig. 1 is a view of the grinder in working position in a lathe, Fig. 2 shows the manner of mounting the grinder in the lathe, and Figs. 3 and 4 are sections through the operating gears and the grinder spindle, respectively.

The grinder consists of a base which is attached to the tool post by a shank or holder and a casing mounted on the base, which is free to swivel so that the driving shaft can be swung in a horizontal plane. The drive is obtained by a rubber friction disk *a*, Fig. 2, held in contact with the lathe cone pulley. The driving shaft *c* is rigidly held by an auxiliary or supporting shaft *d*, and the two are united by a casting providing

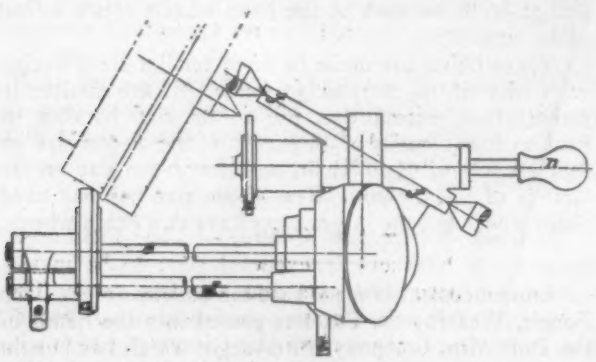


Fig. 2.—Manner of Mounting the Grinder on a Lathe.

a bearing for the friction driving disk which is kept in contact with the cone pulley of the lathe by the handle *e*. Power from the driving shaft is transmitted through the bevel gear *f*, Fig. 3, and the pinion *g* to a pair of spiral gears, *h*, which in turn drive the grinding spindle *i*, Fig. 4. This bevel gear and pinion drive enables the operator to swivel the upper gear housing to any angle without affecting the drive.

When the grinder is to be set up in the lathe the center locating lugs *j*, Fig. 4, on the main base casting, which are fitted with hardened tool steel ends, are placed between the head and tailstock centers of the lathe. These locating lugs are set at an angle of 30 degrees with the center line of the grinding wheel spindle, thus locating the latter at the correct angle

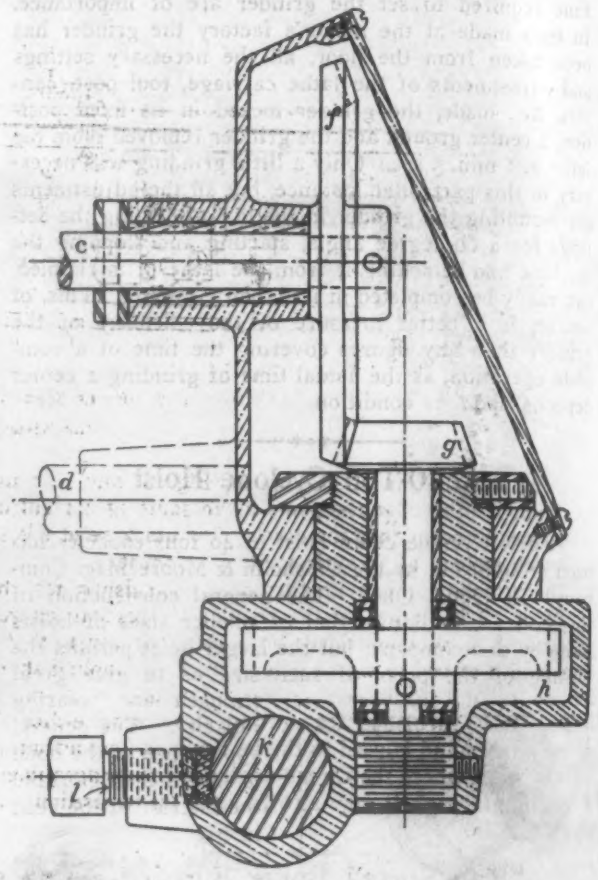


Fig. 3.—Section Through the Gearing of the Drive.

for grinding. While the grinder is accurately located in this way, the tool post holder *k*, Fig. 3, is clamped tight in the tool post, thus locking the angular setting. To prevent the possibility of an imperfect setting due to the tool post holder springing through inaccuracy of the tool post, the screw or the wedges, two holder clamp screws, *l*, are loosened while the holder is clamped solid, thus permitting the whole device to swivel into the plane which has been determined by the lathe centers. After the shank is clamped these screws are tightened, thus fixing the grinder in the correct position.

In operation the grinding wheel *m*, Fig. 2, is brought into contact with the center being ground by the handle *n*, which controls its motion. The tailstock is then withdrawn and all further movement of the

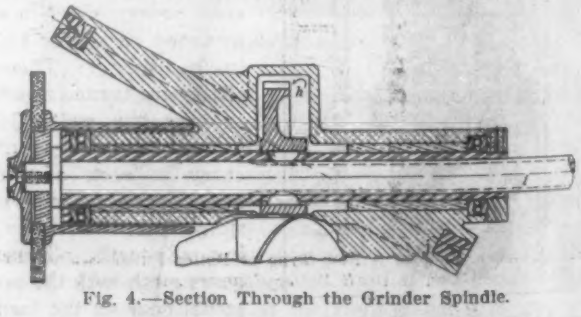


Fig. 4.—Section Through the Grinder Spindle.

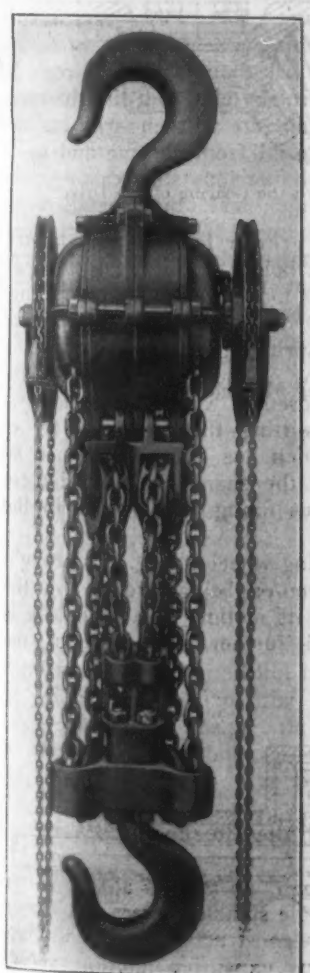
grinder is done by manipulating the lathe carriage and the cross slide.

Friction has been eliminated as far as possible in this grinder by using well lubricated bronze bearings and ball thrust bearings wherever the latter are needed. In the main casting and wherever possible elsewhere

aluminum has been used, thus making the outfit light and easy to handle between the toolroom and the lathe. A telescopic sleeve at the rear of the wheel protects the bearing from grit and dust. The tool post holder is of ample size and is made of cast steel to give the necessary rigidity. Next to the accuracy with which the center is ground, the convenience and the time required to set the grinder are of importance. In tests made at the maker's factory the grinder has been taken from the floor, all the necessary settings and adjustments of the lathe carriage, tool post, centers, &c., made, the grinder locked in its fixed position, a center ground and the grinder removed from the lathe in 1 min. 5 sec. Only a little grinding was necessary in this particular instance, but all the adjustments for mounting the grinder in the lathe, locating the settings for a 60-degree angle, starting and stopping the machine and removing it from the lathe, it is claimed, can easily be completed in less than a minute. This, of course, is a better measure of the efficiency of the grinder than any figures covering the time of a complete operation, as the actual time of grinding a center depends upon its condition.

A 40-Ton Cyclone Hoist

A new Cyclone chain hoist of 40 tons capacity has been brought out by the Chisholm & Moore Mfg. Company, Cleveland, Ohio. The general construction of this hoist is similar to that of smaller sizes of hoists made by this company, but the larger hoist permits the making of the parts of such size as to give great strength and wearing capacity. The general appearance of the hoist is shown in Fig. 1 and the interior of the head in Fig. 2.



A 40-Ton Cyclone Hoist Made by the Chisholm & Moore Mfg. Company, Cleveland, Ohio.

The head of the hoist is divided into three sections by two partitions, the two outer sections each containing a load chain wheel and the central section a pinion and three spur gears. This pinion is mounted on the hand wheel shaft. The two load chain wheels are each mounted on a hollow steel shaft and the hand wheel shaft passes through them, carrying the pinion in the central division, which drives the three spur gears, which are mounted on shafts 1¾ in. in diameter. These shafts are turned down to eccentric ends 1¼ in. in diameter, that carry in each of the outer sections or divisions a spur wheel having 48 teeth. These gears mesh with the internal gear on the load chain wheel having 50 teeth, so that each revolution of the eccentric gives a gyratory movement to the spur wheel and moves the load chain wheel forward two teeth.

The hand wheel shaft turns in graphite bronze bushings and the eccentrics in hardened steel roller bushings. The eccentric shafts are hardened, hardened and ground steel bushings are pressed into the malleable iron frame and the steel rollers are contained in cages.

The hoist has a multiple disk brake which effectively locks the load and at the same time permits free lowering by a reverse movement of the hand wheel.

Fig. 2.—Phantom View of the Hoist Head.

It has two independent load chains moving together, and the idler sheaves are so placed as to permit the doubling up of the chain and carrying the load on eight strands of ¾ in. chain. The idler sheaves are all bushed with graphite bronze self-lubricating bushings. None of the bearings require oiling.

The hoist, as shown in the illustrations, is compact in form. The minimum distance between the upper and the lower hooks is 84 in. and the weight is 2030 lb. The forged hooks alone weigh about 140 lb. each. The hoist is claimed to have a high frictional efficiency: a pull of 80 lb. on each of the hand wheels raises a load of 40 tons.

These hoists are made in three smaller sizes having capacities of 16, 20 and 30 tons. All are similar in construction, except that the 16-ton size handles its load on four strands of ⅝-in. chain, the 20-ton size on four strands of ¾-in. chain and the 30-ton size on six strands of ¾-in. chain. The 16-ton size has one hand chain wheel, but the larger sizes have two chain wheels.

Announcement is made that the business of William Forgie, Washington, Pa., has passed into the hands of the Duff Mfg. Company, Pittsburgh, which has bought the entire Forgie plant, including all rights and privileges of making the oil well jacks originated by William Forgie. This line will be added to the present list of Duff products. Most of the machinery in the Washington plant has been transported to the Duff factory on the North Side of Pittsburgh. William Forgie was one of the pioneers in the jack business, but was exclusively a maker of jacks for oil well operators. His business developed and it was no small concern that the Duff company acquired when it prevailed upon the veteran manufacturer to dispose of his plant.

Machine Tools from the User's Standpoint

John Riddell's Discussion of Machine Tool Design, with Instructive Criticisms*

In the Schenectady Works of the General Electric Company we have a very large variety of parts which have to be machined, but the parts running into the greatest numbers are principally made by our screw machine and punch press operations, which, in many cases, run into the millions.

Lathes

The writer has been considering seriously for a number of years the advisability of having, instead of standard engine lathes, simple turning machines, to produce such pieces as small shafts, which are required in more or less large quantities, but since there is a certain variation as to dimensions in this class of work we could not have our machines so very special that they could not be used for a general run of similar work.

It has been the practice for a long time when, if several lathes were required for any particular department, standard engine lathes would be purchased, which machines would be fully equipped with screw cutting, cross feed, rod feed, compound rest, large and small face plates, and, very frequently, with an extra block for large outside turning. Many such machines have been purchased with the view of being transferable from one department to another as emergency would arise, and it was thought advisable on this account to have the machines as universal as possible. Experience has taught us, however, that an engine lathe once placed in one of our shafting departments would, in many cases, wear itself out before having to do any face plate or chucking work, and, very seldom, screw cutting. You can therefore see that the cross feed, as well as screw cutting, would be superfluous. Lathes for this work should be equipped with a powerful rod feed, and with a suitable friction device which would slip if the turning tool should meet with any obstruction, so as to prevent serious accident to the machine.

Such machines should be so designed that the screw cutting attachment and cross feed could be readily applied, if in the future they should be required, which, in our case, would be in very rare instances.

Many attempts have been made to solve the problem of small shaft turning, with more or less success, but many of the machines designed for this purpose have been more or less complicated, which precludes the possibility of putting inexperienced men on to run them.

A lathe to be used exclusively for shaft turning, say, from about 2 to 4 in. in diameter, would not require the range of speeds as for a standard engine lathe. A standard engine lathe of about 18 or 20 in. swing should be geared from about 3 or 4 rev. per min. up to about 600. The lathe I have in mind should have a range of speed of from about 20 rev. per min. to about 250 for turning, and two or three higher speeds for filing and polishing. These speeds should possibly be between 450 and 600 rev. per min. It is desirable in our case at least to have such machines fitted for electric motors. The motors should have a speed variation of about 2 to 1, which, with two or three gear changes, should give all the speeds necessary for a simple turning machine.

Automatic Screw Machines

The automatic screw machine, in a general way, is made so that six, seven or eight operations can be performed on most any of them. Whereas a very large quantity of work going through them requires but two or three operations at the most, such as milling, threading and cutting-off. Many of the screw machines are so complicated that they will perform the operations whether the tools are actually working or not.

It would seem that machines could be very much simplified by making some do three or four operations only, and not encumber them with too many useless parts, or at least parts which will have to be running whether they are actually performing any useful work or not.

The same is true of some larger automatic turret machinery. Some of these machines are designed for boring and facing, but nevertheless the turret will have five or six positions, all of which operations must be gone through with whether there are but one or two simple operations to be performed at the loss of much valuable time.

Machines, such as shapers and slotters, appear to be as simple in construction and design as they should be made, and they have all the necessary feeds and speed variation.

I am glad to see that some of our wide-awake machine tool builders are making variable speed planing machines. This would seem quite necessary at present on account of the great variety of material which they are called upon to machine.

In the old days a planing machine that would operate at 20 ft. per minte was thought all that could be desired, but it must be borne in mind that they had very few kinds of material to operate on then; whereas now we have a range of material from chrome and nickel and vanadium steels to the various steel castings, and from cast iron to aluminum and other metals which can be operated at a high speed. It is, therefore, necessary in a great many cases to have planing machines which can operate at a satisfactory speed on any kind of material. This can be accomplished by variable speed motors, or through gear change boxes.

Milling Machines

In regard to milling machines generally we have a pretty large range to select from at present. If we want the simple hand milling machines there are several good ones made, as well as the Lincoln type miller — various plain milling machines, universal millers, and the various types of vertical millers.

Drill presses have been very well taken care of also. We have our sensitive drills, which can be purchased with any number of spindles, with one or two changes of speed. We also have a full line of upright machines, which can be purchased with or without tapping attachment. The tapping attachment has become a necessity in a great many cases, and is a very useful addition. I have heard several complaints about the breaking of taps by their use, but with simple tap holders, which can be adjusted to slip before breaking, this latter fault should be overcome.

A great deal might be done toward adapting multiple spindle heads to single spindle presses. It is very doubtful if, as at present constructed, it is good judgment to put in too many expensive multiple spindle drills, for the reason that it takes so long to adjust them for a small number of pieces.

Radial drills generally should be so stiffened up as to permit of only the smallest amount of spring to the arm. I believe more drills are ruined by the springing of arms, both under the actual pressure and when a

* Read before the National Machine Tool Builders' Association, New York, October 26, 1910.

drill is breaking through than would be if it were not for the springing referred to, as under the pressure of drilling the arm goes up, and when the pressure is relieved from the point the drills are forced through and in many cases catch on the lips and break.

Grinding machinery generally is probably as near perfection as can be expected. The wearing parts are well protected from grit, and feeds well taken care of, and there seems to be very little to be desired from the user's standpoint. There is one very important point, however, about all grinders, and that is the protection from injury to the operator by the breaking of wheels and dust. There should be exhaust hoods of ample capacity provided with each dry grinder, as well as some safety device to prevent the wheel from flying in case it should break. This applies to all kinds of grinders.

Horizontal boring mills as made at present are well up to the times, but in a great many cases, due to the requirements of gasoline engine cylinders and other work of a similar character, special machines should be provided for the purpose. This work is very particular, and in many cases slow and difficult; due frequently to one end being closed; cylinders being cast *en bloc*, and the irregularity of rough castings and the exacting requirements of our engineers.

Vertical boring mills are built for various purposes, from car wheel borers up to machines taking 25 ft. or more. I do not believe it pays to unnecessarily complicate such machines. Rigidity and accuracy are the essential points in all machine tools, and these features should not give way to unnecessary complication of parts. All gears and counterweights should be thoroughly protected against injury to the operators.

Electric Drive—Safety Appliances

From experience extending over some 28 years in the electric motor business, I am a thorough believer in the electric motor drive. Criticism has been made that on universal machines which might be called upon to do from a fraction of a horsepower of actual work, to six or seven hp., that the invesement is unnecessarily high as compared to group driving such machines. To a certain extent this is true but if more care was exercised in designing and selecting as above outlined this criticism would disappear. We must consider the flexibility of the electric motor drive, bearing in mind that a machine so equipped can be taken from any part of a large manufacturing plant and placed in another part, and can be running in a very short time in any remote location where there is no other sourse of power. It will only absorb the amount of power actually required to do any particular job, and on the other hand we must consider the line shafting with its numerous hangers, pulleys, countershafts and belts, which must be kept oiled and repaired. Go into any large screw machine department and see the number of belts in actual use to get a clear idea of the situation.

We have had considerable trouble at the Schenectady Works of the General Electric Company lately in trying to conform to the new State laws, which are very stringent as to the protective devices on machine tools in general and woodworking machines in particular. It is an exceedingly difficult matter to so protect buzz planers and circular saws as to guard against carelessness and the apparent indifference of the workmen, and if some one would devise proper ways and means for protecting such machines he would have the thanks and blessing of the whole manufacturing fraternity.

Accidents are frequently due to carelessness on the part of the operators, because, first, they will not take time to shut down their machines when making adjustments, for the reason that a spindle running 3000 or 4000 rev. per min. would require an appreciable length of time to come to rest and also to start again. This would suggest some suitable brake which would quickly and effectively stop such machinery without complicating it.

If an operator has a great many pieces of a similar kind to either saw, plane or shape, he may possibly take pains to apply such guards, which are usually provided; but if, as frequently happens, a man wants to plane one single piece or saw a strip from a board, he will not take time to adjust the safety appliance, and he is very apt to be caught. This would point out the necessity of having some suitable guards which would always be available no matter what the conditions were, and it would seem that people producing this particular line of machinery would conjure up something practicable and effective. As it is, the market is flooded with unsatisfactory devices, which in many cases are mere traps and generally do more harm than good; but the law says we must use something.

Punch presses in general are very well designed, but they, like woodworking machinery, are comparatively dangerous to the fingers of careless or dreamy operators. We have in the Schenectady Works of the General Electric Company several hundred of such machines, and have applied a great many safety appliances and devices to protect the workmen against thoughtlessness, but it appears that no matter what we have been able to apply they are either taken off and thrown to one side or neglected in some manner so that sooner or later an operator is apt to get a finger pinched. This would suggest automatic feed mechanisms and something to take the piece from the dies after the operation is completed. There have been enumerable devices of this kind exploited, but nothing as yet seems to cover the ground fully.

Another defect in this class of machinery is the fact that in many instances when clutches and other parts come loose, due to wear, they are very apt to repeat the stroke. This frequently happens when a man's hand is between the dies. Such accidents should be impossible until the operator deliberately steps on the treadle.

Noise in Machine Shops

It has been pointed out that there is a great deal of gear noise in the machine shops of the present day. I am sorry to admit that this is true, but it is not wholly due to the fact that there are more gears used in the construction of machine tools, but is more especially due to the higher speeds at which machines are run to-day, as compared to 10 or 20 years ago; as I mentioned before in reference to planing machines. Before the advent of high speed steels 20 ft. was considered to be a fair cutting speed for an ordinary steel shaft or a piece of cast iron to be either turned or planed; whereas to-day, we are actually turning shafts at from 75 ft. to 125 ft. per min. So it will readily be seen that machines to-day are producing from three to six times more work than they did a few years ago; hence it should follow that there would be more noise due to machine tools producing this extra amount of work. These gear noises are very unfortunate, but we hope by improved gear cutting machinery and the use of various other materials which have recently been introduced, that this trouble will gradually disappear.

Muslin Gears and Pinions

We have at the Schenectady Works introduced gears and pinions made of a high grade of muslin which have been applied to a great variety of uses. We have used one of them on a boiler maker's punch and shear which previously gave considerable trouble, not only on account of noise, but in the actual breaking of the gears; due to excessive back lash and fly wheel action on the machine. We had such wonderful success with that particular pinion, which has been running now some two years, that we gradually extended the use until now we are using them on two 10-ft. planing machines, which are operated by electric mo-

tors and compressed air clutches, as intermediate pinions for the reverse motion. Heretofore we have tried various substitutes, including bronze, which would go to pieces in two or three weeks; steel would last longer, but made an intolerable noise; rawhide would seem to shrink and burn out quickly, and we very seldom could find anything that would stand the work longer than three or four weeks at the most.

It is, perhaps, too early to say much about the particular pinions in question, but they have at present been running four months, and they have not yet begun to show any signs of distress, and it looks as though their life would be as long as the gears with which they mesh.

I might ask your indulgence while I describe what has recently been done with a pair of these pinions. As I said before, we have been using them some two years and are gradually extending their use, and have now fitted up a large department at the Lynn Works of the General Electric Company where we can produce them in fairly large quantities, but before putting them out in very large quantities we desired to have a life test to destruction, and with this in view we rigged up two railroad motors opposed to each other. One of these has a cloth pinion on the armature shaft running into a steel gear on countershaft. On the other end of this countershaft is another cloth pinion engaging with another large steel gear. The other side of this steel gear engaging a cast gun iron pinion of the same dimensions as the cloth. This then connects with its shaft and gear to a rawhide pinion on the opposite motor. This particular motor is resisted by rheostats to load the motor which has the muslin pinion. In starting this test it was found that there were no results from a certain load. This load was gradually increased, and when after stopping the motors to examine the pinions, through some oversight, an excessive overload was applied when they were again started. The shock was so severe that it broke about one-half of the teeth from the gun iron pinion, leaving the two muslin pinions in as good condition as before. Another gun iron pinion was put on, which also broke. A third was then put on and the load reduced, and the life test has now been running some two or three weeks, and will be continued until some of the gears actually wear out and not break.

I point this out to show the actual strength of pinions made of this material. So we have reason to believe that with time the noises in machine shops will gradually disappear as they came, without, however, a corresponding reduction in output.

I will not attempt to mention in detail the vast number of standard, to say nothing of special machines, which are at present in use. To sum up briefly, the essential requirements are simplicity, rigidity and accuracy, with ample protection for the workmen.

There is one other thing that must be borne in mind in the production of machine tools, and that is the gradual disappearance of the old time all-round mechanic. It has frequently been pointed out when some special machine tool was brought out to reduce costs of certain operations, that such a machine could be operated by a farmer boy, or one without any practical knowledge of machine tools. This has very seldom proved to be the case as such a one cannot make the necessary adjustments on such machines. Therefore, simplicity is a prime factor in machine tool designing.

The McCrum-Howell Company, New York and Chicago, has secured control of the Model Heating Company of Philadelphia and New York and will retain the entire sales organization of that company. In addition to the Model boilers and radiators heretofore handled by the Model Heating Company the McCrum-Howell Company offers a complete line of vacuum cleaning apparatus, both portable and stationary.

New Lang Tool Holders

The G. R. Lang Company, Meadville, Pa., has placed on the market the two new tool holders which are illustrated herewith. These holders have been developed in response to a demand for one that will not only cover the range of work now done with the ordinary tool holder, but which will also displace the solid tool on a large class of work which is now beyond the range of economical operation with the usual holders. A triangular cutter of twice the area and twice the depth of the usual square cutter is used. The size of the point and the method of clamping give sufficient

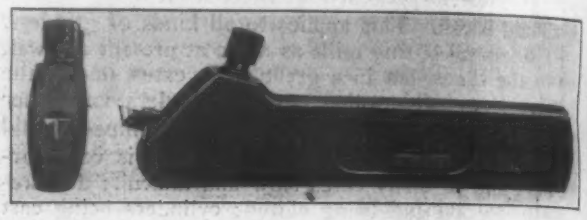


Fig. 1.—End and Side Views of the New Lathe and Shaper Tool Holder Made by the G. R. Lang Company, Meadville, Pa.

area for heat radiation and rigidity, and the cutter is supported at the point directly opposite the direction of the thrust, thus preventing the point from springing down or backing away from the cut. These cutters are rolled to the proper dimensions in bar length and can be purchased as readily as square sections.

The general lathe and shaper tool for the lighter classes of work is shown in Fig. 1. These tools are made in three different sizes, and the sizes of the cutters range from ¼ to ½ in. triangular steel. Any shape

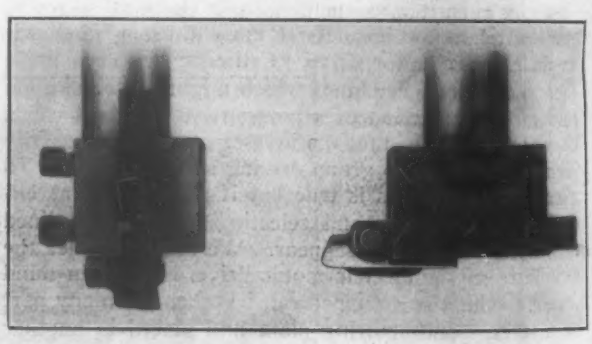


Fig. 2.—Two Views of a Lang Tool Holder for Vertical Boring Mills.

of cutter point can be ground with this triangular steel the same as with the square stock, and the saving in weight of steel used, it is claimed, will pay for the holders themselves. The cutter is mounted in a V-shaped seat, which not only gives a larger bearing but makes a perfect fit on both sides, thus giving substantially a solid tool. This cutter seat is milled lengthwise in a steel bushing which is pressed into a round hole and is interchangeable. Tempered tool steel is used for the entire holder including the set screw and the bushing.

The other tool holder, illustrated in Fig. 2, is designed for use in vertical boring mills. This cutter is extra large, and its special field is the taking of heavy roughing cuts. Owing to the shape of the cutter it is only necessary to grind it on the end to resharpen it as the top and side angles are correct. This holder is made in five sizes for tool post openings ¾ in. long by 1 in. wide up to openings which are 1¼ in. long by 1⅞ in. in width.

The new furnace of the Wickwire Steel Company, Buffalo, N. Y., which blew in October 1 and was active throughout the month, is known as Harriet Y. The original furnace of this company will be known as Harriet X.

The Rockford 15-In. Lathe

Equipped with a Special Gear Changing Arrangement

A lathe which is especially designed to meet the requirements of tool room work and manufacturing has been placed on the market by the Rockford Tool Company, Harrison avenue and Eleventh street, Rockford, Ill., and is illustrated herewith. Fig. 1 is a general view of the tool and Fig. 2 shows details of the change gear mechanism. The construction is heavy with numerous reinforcing ribs so as to handle heavy cuts.

The headstock is heavily built and well braced so as to resist any stress or strain which may be put upon it. As illustrated the tool is equipped with a five-step cone pulley, the largest having a diameter of 10¼ in. and a face width of 2⅜ in. The ratio of the back gears is 10 to 1. The lathe can also be furnished with a three-step cone pulley with double back gears where considerable power is required. The faceplate is heavy and reinforced by a number of ribs to prevent springing when the work is clamped. The spindle is of crucible steel and has a hole 1⅜ in. in diameter through its entire length. Phosphor bronze bearings are used; the front one is 2⅝ in. in diameter and 4 in. long and the rear one 1 5-16 in. in diameter and 3 in. long.

The bed is heavy and reinforced by ribbing. The webs in the sides are placed as nearly as possible under the shears to prevent chatter and spring when heavy cuts are being taken, and the shears themselves are large and have ample bearing surface. The carriage also has a large bearing surface and is gibbed both front and back. The feed reversing mechanism is contained in the apron, which is also ribbed, and the design is such that the split nut and the feed cannot be thrown in at the same time. The tailstock is also of rigid construction, and the spindle is 1 15-16 in. in diameter and has a travel of 6 in. The centers of both the head and tailstocks are bushed for a No. 3 Morse taper.

The cross slide and the compound rest feed screws are both graduated and taper gibs are used to compensate for wear. The compound rest can swing through an angle of 90 degrees. All numbers of threads from 3 to 20 per in., including an 11½ pipe thread, can be cut and every even number from 20 to 40.

In substituting one set of change gears for another no wrenches are required, and the substitution is easily and quickly made. The stud and the lead screw have a ball catch, which is shown at *f* in Fig. 2. The hole *a* in the idler gear bracket *b* can accommodate all the change gears, and the stud has two large washers *c* which clamp on the bracket. The stud has a knurl *d* and a permanent wrench *e* for locking the idler gear at any point within the range of the bracket.

The following table gives the principal specifications and dimensions of the lathe:

Swing over bed, inches	15¾
Swing over carriage, inches	10¼
Maximum distance between centers, 6-ft. bed, inches	36
Diameter of front spindle bearing, inches	2⅝
Length front spindle bearing, inches	4
Diameter rear spindle bearing, inches	1 13/16
Length rear spindle bearing, inches	3
Diameter of hole through spindle, inches	1⅜
Diameter of tailstock spindle, inches	1 13/16
Diameter of largest step on cone pulley, inches	10¼
Width of belt, inches	2¼
Ratio of back gear	10 to 1
Diameter of countershaft pulley, inches	10
Face of countershaft pulley, inches	3
Speed of countershaft, revolutions per minute	150
Weight, pounds	1,550

In addition to the 6-ft. bed, this lathe is also made with beds 8 and 10 ft. long. The equipment regularly furnished with the lathe includes a large and a small face plate, follow and back rests and the necessary wrenches. A taper attachment can also be furnished if desired.

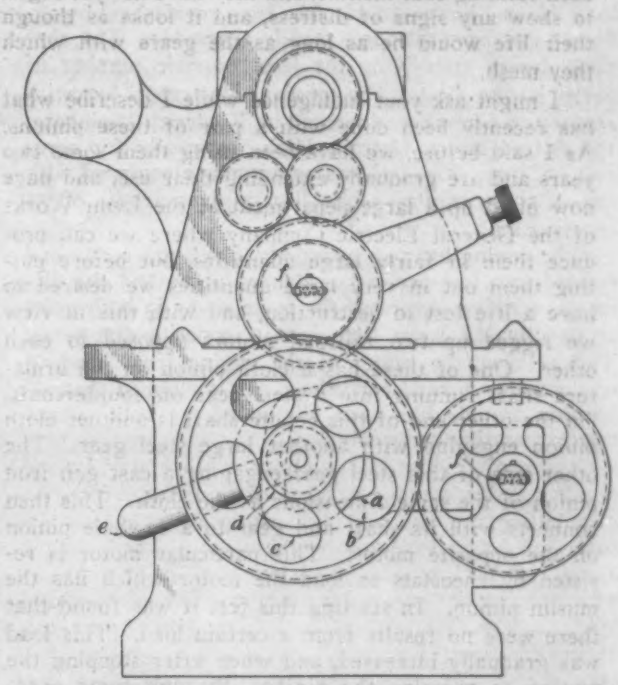


Fig. 2.—A Detail of the Head End of the New Rockford Lathe.

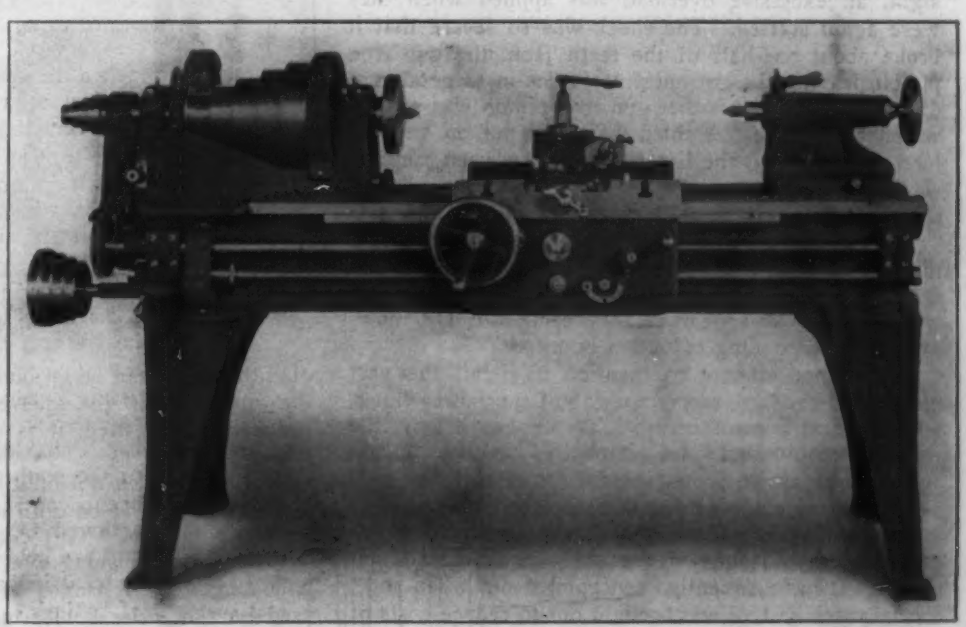


Fig. 1.—The New 15-In. Lathe Built by the Rockford Tool Company, Rockford, Ill.

The Texas-Mexico Commission Company, El Paso, Texas, announces that the business heretofore conducted under the name of that company will hereafter be transacted under the name of the W. A. Cannon Company, but without change in ownership or management. The company represents manufacturers in the sale of machinery and general supplies for mines, mills, smelters and railroads. W. A. Cannon is manager.

The Weinberg Revolving Cylinder Gas Engine

A Light Weight Two-Cycle Motor Designed Especially for Aeronautical Use

In a gasoline engine it is a problem to obtain the greatest power with the least weight and fuel consumption. At the same time the motor should have long life and be reasonably free from repairs and breakdowns and have all parts readily accessible. The simplest design embodying the least possible number of parts is the best. The engine illustrated herewith represents a new type invented by Frederick Weinberg, 118 Alfred street, Detroit, Mich., especially for aeronautical use. Fig. 1 shows an aeroplane equipped with one of these engines while Fig. 2 gives details of its construction.

The engine has two cylinders, which are really one divided into two perfectly balanced units, and the different working phases of the cycle occur in both units at exactly the same time but in opposite directions. This relieves the center of the engine from bending strain under normal conditions. It is claimed that all ignition trouble has been eliminated, as both sparks must occur simultaneously.

The engine shaft is stationary, while the cylinders revolve, and advantage is taken of centrifugal force in distributing the gas and exhausting it. The pistons describe a true circle around the wrist pin and during a half revolution form a vacuum in the crank case which draws the gas and oil mixture through the hollow crank shaft into the case, where it is compressed during the next revolution. A valve between the carburetor and the engine prevents the gas from being driven back. It then enters a cylinder through a by-pass and drives out the burnt gas through the exhaust port. A short time before the head of the piston clears the by-pass the exhaust valve is opened mechanically and the burnt gas is driven out by centrifugal force. While most of the gas is driven out in this way before the piston head reaches the opening and as the exhaust is still open at this instant, the new charge helps to assist in expelling the remainder of the burnt gas.

Fig. 1.—The Weinberg Two-Cycle Revolving Cylinder Gas Engine Mounted on an Aeroplane.

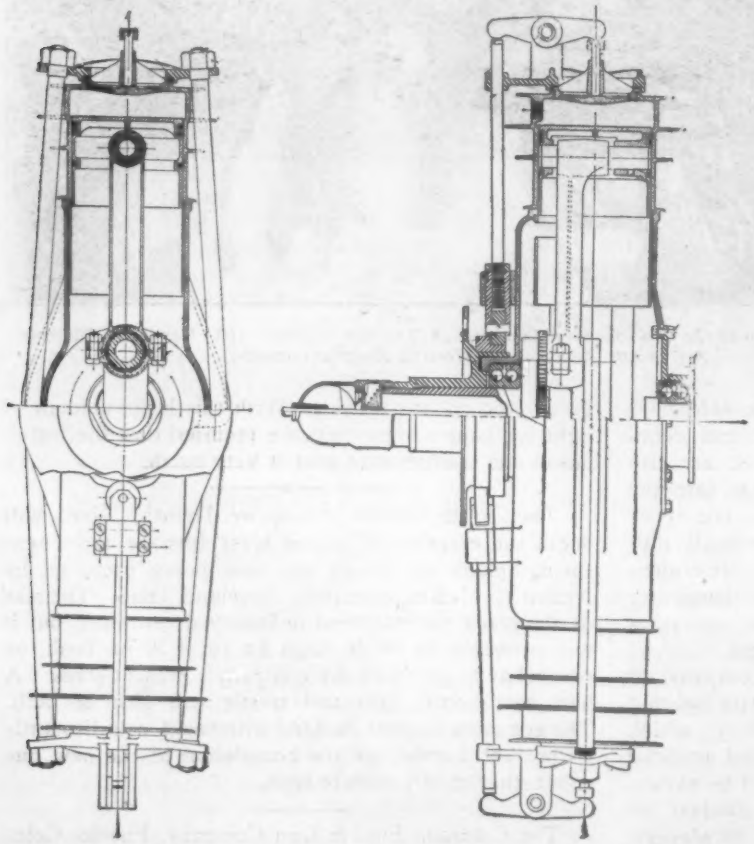


Fig. 2.—Front and Side Elevations, Partly in Section, of the Weinberg Revolving Cylinder Gas Engine.

The crank case is aluminum and is cast in one piece. The cylinders are cast iron machined all over and the pistons are the same material and contain three rings, two above and one below the wrist pin. The crank shaft is double throw and made hollow to reduce weight and also admit the charge of gas. The exhaust valve is located in the head of the cylinder and is designed to empty it in a minimum time. These valves are of the poppet type and are positively opened at the proper time by levers actuated by eccentrics on the shaft and are held closed at all other times by centrifugal force without the aid of springs.

The magneto is driven positively at the same speed as the crank shaft, which is claimed to insure easy starting of the engine without the aid of a battery. The current is generated and distributed to a sector and from there to both spark plugs at the same time, an arrangement which, it is claimed, insures the firing of both cylinder units at the same instant and avoiding any possibility of one missing fire.

The cylinders are effectively cooled by their revolving rapidly in the air and being at the same time exposed to the cooling draft of the propeller. Heat is thus easily radi-

ated from the cooling flanges and all possibility of overheating is said to be avoided.

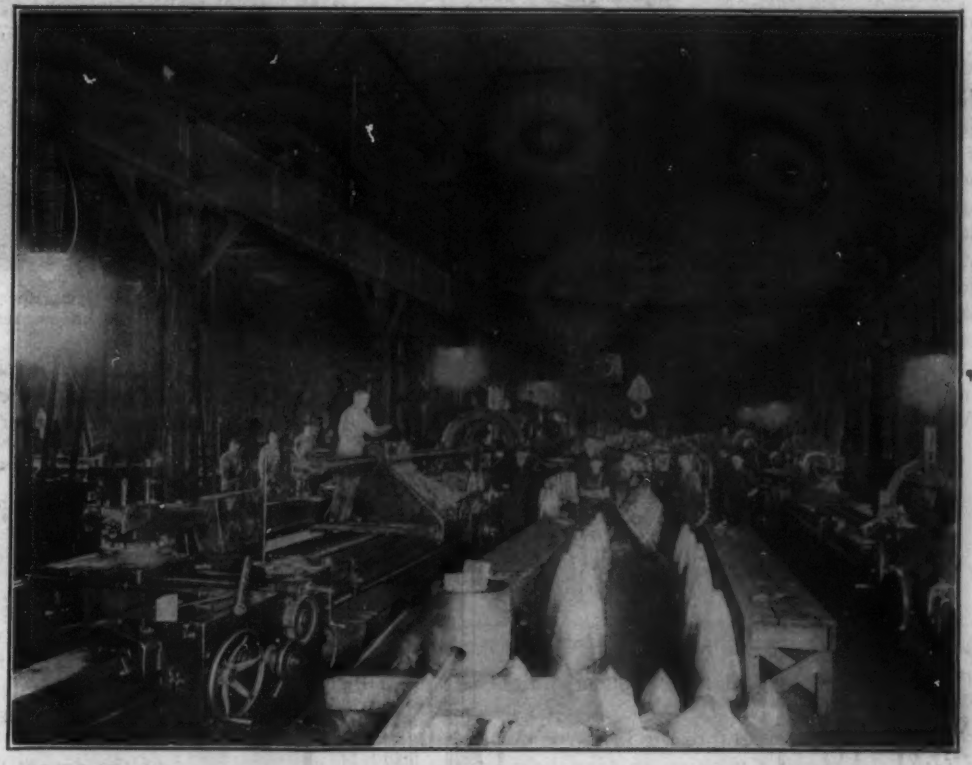
The engine is held together by two tension bars terminating at each end in a valve cage retainer in which the valve is seated. These rods bind the whole together tightly. From the design of the engine the action of centrifugal force keeps the valve tightly seated, and the whole cylinder is in compression instead of tension. The tension bars are of sufficient size to withstand the pressure at high speed, and there is no danger of the parts becoming loose or thrown off.

Ball bearings are used throughout and the engine is lubricated by the spray system, in which oil is drawn into the crank case in the form of a fine spray, thus positively oiling all internal working parts.

The over-all dimensions of the engine are 5 x 5 ft. and the weight is 110 lb. The speed attained under load is 1200 rev. per min.

A Hawthorn Flaming Arc Light Installation in a Gun Shop

One of the problems in connection with large iron and steel mills, foundries and machine shops is efficient artificial lighting. Prior to the perfection of the flaming arc lamp the most efficient illuminant was the carbon arc, which is still used to some extent. Where the ceilings are high as in foundries, steel mills and machine shops, lamps of great penetrating power must be used, since at the present time traveling cranes are used in almost every mill of any size, and it is necessary in most cases to hang the lamps above these cranes. The large machine shops and foundries are generally built with two or three bays, a popular arrangement, being one central bay where the heavy work is handled and one or more side bays usually having galleries where the lighter and detail work is carried on. Frequently the side bays are also equipped with traveling cranes, and in that case the lamps are hung around the sides of the bay. The upper gallery and the main bay are, however, generally illuminated by hanging flaming arc lamps above the cranes. The special advantages of these flaming arc lamps are great brilliancy and penetrating power, low operating expense and the agreeable effect of the light.



The Harrison Gun Shop of the Crucible Steel Company of America Lighted with Hawthorn Flaming Arc Lamps Made by the Western Electric Company.

For some time the Crucible Steel Company of America experienced difficulty in satisfactorily lighting its gun and projectile shop at Harrison, N. J., which is operated day and night, thus requiring good artificial illumination. The shop was formerly lighted by carbon arcs, but these proved unsatisfactory. Individual incandescent lamps hung near the various lathes, planers, and other machines were next tried, and it was thought that this would solve the lighting problem. It failed to do so, however, as the men on the night shift were continually having trouble with their eyes, and finally flaming arcs were tried.

After a thorough test seven Hawthorn flaming arcs, made by Western Electric Company, Chicago and New York, were installed in the main gun shop and three in the adjoining shop. These lamps were run two in series on a 110-volt circuit and, although the voltage is very unsteady due to the fact that two or three 40 or 50 hp. induction motors are often started or reversed simultaneously, the lamps are said to operate very satisfactorily.

One of the interesting features resulting from the installation of these lamps is the increase in the amount of work turned out by the night shift, which was a little over 10 per cent. The amount of light together with its quality is said to be responsible for this increase. The golden yellow rays given out by a flaming arc lamp approximate natural sunlight and are easy on the eyes.

Although the lighting of foundries has heretofore been difficult because of structural conditions, overhead cranes and the presence of smoke and dust, it is said that one or two flaming arcs hung above cranes will satisfactorily light a foundry measuring 50 x 100 ft. at a very slight expenditure for power, since one lamp gives 3000 cp. at 550 watts. With this large amount of light per lamp so few units are required that the installation and maintenance cost is very small.

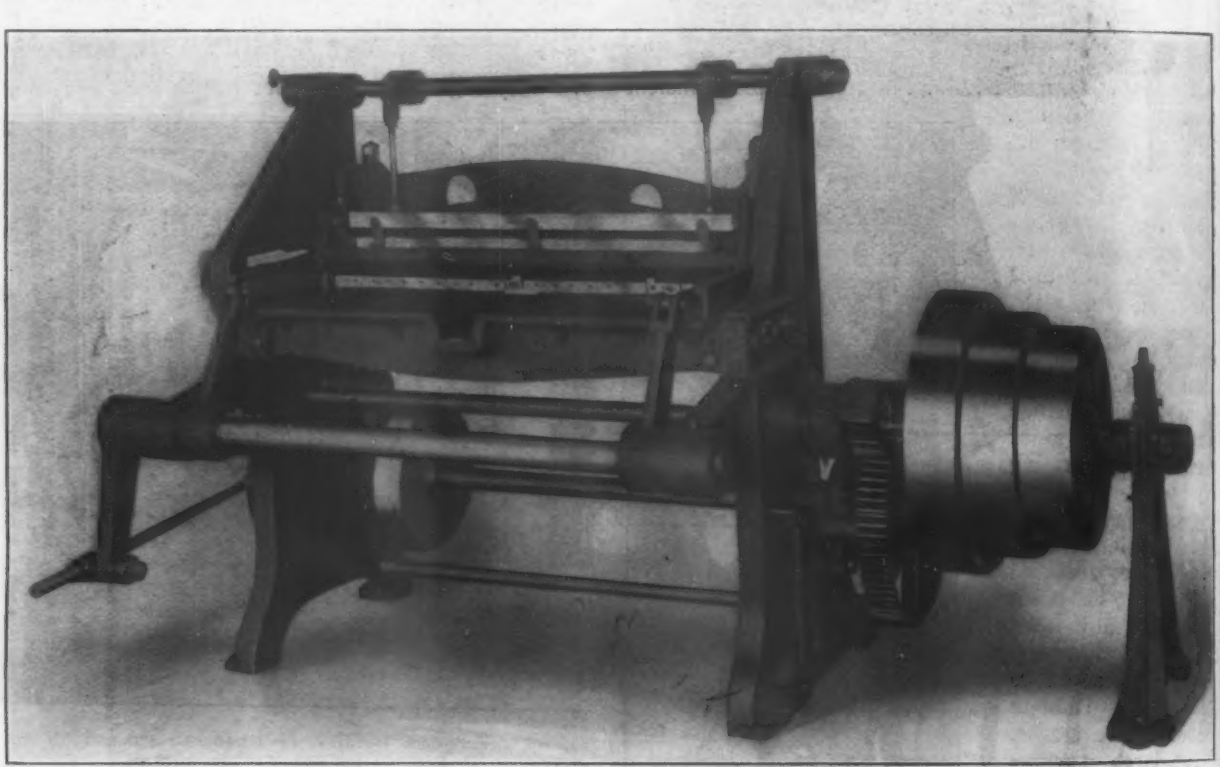
The Zenith Furnace Company, Duluth, Minn., will begin the erection of a new blast furnace early next spring, plans for which are now being prepared by Arthur G. McKee, engineer, Cleveland, Ohio. The size of the stack has not been definitely determined, but it will probably be 78 ft. high by 17 ft. 6 in. bosh, or somewhat larger than the company's present stack. A new cast house, bins and trestle will also be built. The company has not decided whether it will dismantle its present furnace on the completion of the new one or whether it will operate both.

The Colorado Fuel & Iron Company, Pueblo, Colo., blew in its B furnace October 3 and blew out its A furnace October 27, leaving three furnaces in blast November 1.

The Niagara Automatic Feed Squaring Shear

The Niagara Machine & Tool Works, Buffalo, N. Y., has equipped its line of power squaring shears with an automatic feed capable of taking hold of a sheet of stock and placing it in the proper position for cutting into strips of any desired width up to 12 in. In use the sheets being cut are supported by a bench or a platform of wood which is built in front of the machine.

The gripping mechanism is carried on a slide actuated by rock levers from a crank disk on the main shaft. The stroke of the slide can be readily adjusted on the crank disk to the width of the strips to be cut and the gripping jaws will always feed up to within ⅞ in. of the knives regardless of the width of the strip. The upper gripping jaw clamps the material by toggles which have an adjustment to care for various thicknesses of stock. A holddown attachment actuated by a cam and lever from the main shaft is placed between the gripping jaws and the knives. This holddown bears on the stock before the jaws commence to recede from the starting position to take hold of the sheet further back and consequently the material is always held firmly. Should it be desired to raise the holddown quickly when it becomes necessary to stop the machine and release a sheet after it has been partly cut this can also be done.



A Sheet Metal Squaring Shear with Automatic Feed Built by the Niagara Machine & Tool Works, Buffalo, N. Y.

Three different rates of speed are available and a three-step cone pulley with step diameters of 22, 19 and 17 in. respectively is provided. The machine is back geared with a ratio of 4 to 1 and the speed of the slide is 46, 60 and 80 strokes per min., the slowest speed being used for the widest strip. The motion of the machine is controlled by the Niagara shear clutch, which is so arranged that it can be tripped either by foot treadle or by a hand lever. While the material is being fed forward the motion can be stopped at any time by releasing the pressure on the treadle or moving the hand lever.

In the engraving the feed is shown applied to the No. 236 power squaring shear, which is adapted for cutting iron of No. 14 and lighter gauges, but it can be applied to other sizes and types of the maker's shears where the cutting length does not exceed 52 in. While the feeding device can be used on practically all grades of stock it is better adapted to the fairly heavy material rather than to the lighter gauges.

Kane & Roach Wire Straighteners

Two new machines especially designed for use in wire mills and rivet and bolt works for straightening material from the coil as it passes into the heading machine have been developed by Kane & Roach, Syracuse, N. Y. Fig. 1 shows a 12-roll wire straightener and Fig. 2 the No. 1 automatic wire straightener and shears with automatic dumping table. In the construction of both of these machines several new features, it is claimed, have been embodied which differentiate them from others on the market.

The 12-roll wire straightener has as distinguishing features the cam motion and lever for opening the rolls to get the stock between them and the ability to handle wire ⅝ in. in diameter. It will be noticed from Fig. 1 that all the rolls are mounted on adjustable plates. The three lower ones are mounted on a plate which is adjusted by the screw shown underneath so as to keep them in line with the other rolls. The three upper rolls are arranged so that each is adjusted in a vertical direction independently of the others in the plate, and the whole plate is adjusted by moving a lever at the right side, which is connected with two cams and the side connections. Giving this lever a half turn slides the upper plate and the three rolls up ½ in., thus allowing plenty of freedom to slide the stock in regardless of its crooked condition. The horizontal rolls are adjusted in exactly the same way. This machine is heavier than usual for a wire straightener, the hardened steel rolls are of large diameter and the journals upon which they run also are of hardened steel. In operation the material is fed from the coil and passes through these rolls, which straighten it before it enters the heading machine, one operation straightening it both up and down and sideways.

The No. 1 automatic wire straightener and shears with automatic dumping table shown in Fig. 2 is a special machine for this class of work. Both the upper and lower rolls are driven by gears and are arranged with several passes for different sizes of material, and

can be used for rounds, squares, hexagons and flat bars. The straightener illustrated is arranged for handling round stock from ¼ to ½ in. in diameter and has two sets of passes for straightening material as it comes from the coil, or, if desired, two coils or two bars may be run through simultaneously.

The automatic dumping table can be made in any desired length and is arranged with stop gauges so that the material is cut off to any length and the table dumps the stock automatically into a cart or other receptacle. The speed of operation is from 100 to 150 ft. per min., which can be doubled by straightening two

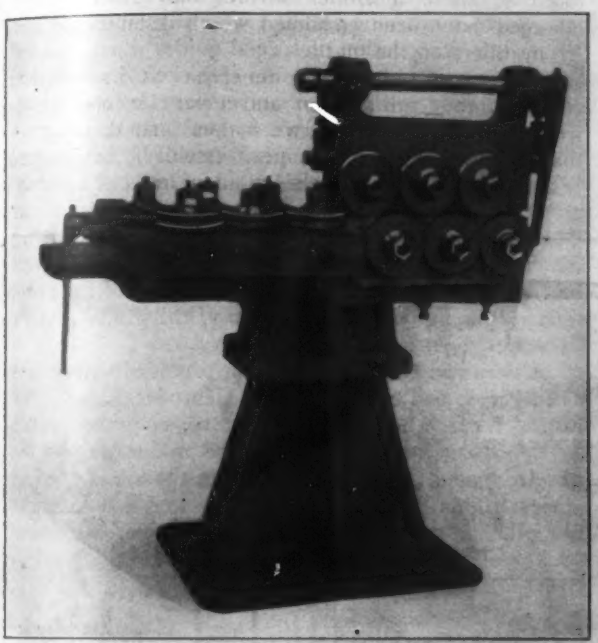


Fig. 1.—A 12-Roll Wire Straightener Built by Kane & Roach, Syracuse, N. Y.

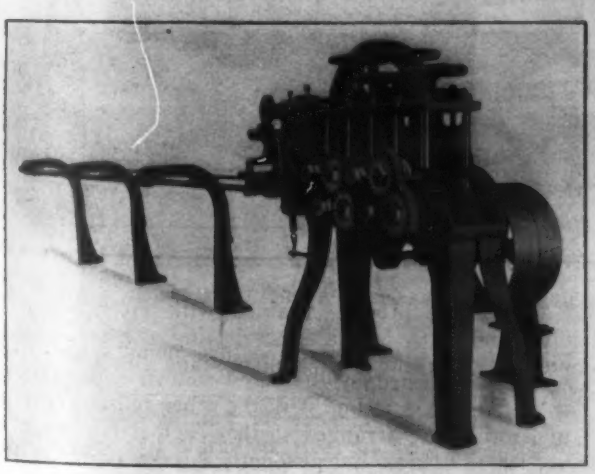


Fig. 2.—The No. 1 Automatic Wire Straightener and Shears.

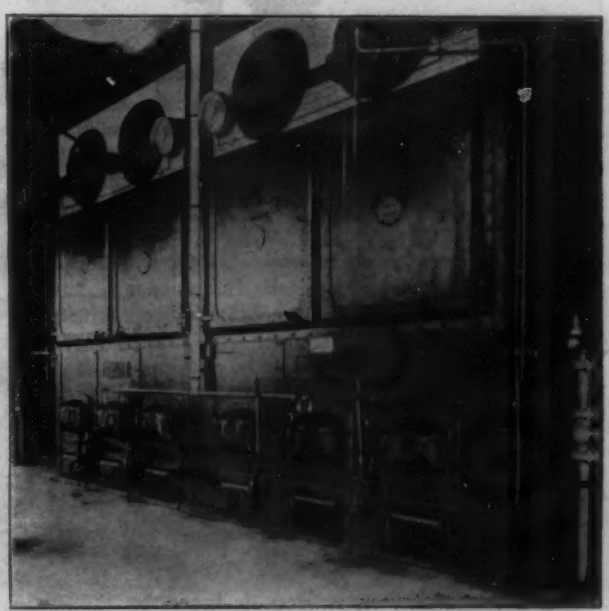
bars at a time. Three-quarter inch stock can also be straightened and cut off automatically in this machine, but in this case only one bar is handled at a time.

The C. C. & E. P. Townsend Company, New Brighton, Pa., has completed its new additions, the boilers and engines are in place and special machinery of its own manufacture for making nails, rivets and wire specialties is now being installed. The new plant will be ready for full operation about January 1. The buildings are of steel, brick and mill type construction. The increased production over the older plant will approximate 50 per cent., with the advantage that the new plant has been designed for continuous operation, the raw material being worked through the different processes from one end of it to the other. Charles L. Stewart, formerly with the Pressed Steel Car Company, Pittsburgh, is now Eastern sales representative of the company, his district taking in the cities east of Pittsburgh and through the New England States.

Test of the Miraflores Boiler Plant

Two installations aggregating 5000 hp. are at present in service on the Panama Canal at the Gatun and Miraflores locks, and the steam is used in connection with the generation of electricity to operate the cableways for placing the concrete. Some idea of the magnitude of this work can be gained from the fact that the lower locks are 41½ ft. deep and the two upper locks are each 30 ft. deep, while all are in pairs 110 ft. wide and 1000 ft. long. To construct one set of locks requires 2,000,000 barrels of cement, 2,000,000 cu. yd. of crushed stone and half that quantity of sand.

The government specification for these boilers required an evaporative efficiency of 65 per cent. when evaporating 17,000 lb. of water from a feed water temperature of 210 degrees F. to a gauge pressure of 205 lb. absolute and 150 degrees superheat. Each boiler was also required to have not less than 4000 sq. ft. of heating surface. When operating under the



Two of the Boilers Installed at Miraflores, Panama, by the E. Keeler Company, Williamsport, Pa.

conditions given above with 1 oz. of induced draft and a grade of Pocahontas coal having a fuel value of 14,000 B.t.u. per pound, a thermal efficiency of not less than 65 per cent. was to be obtained. The ratio of superheating surface to the heating surface was to be approximately 1 to 5 and the ratio of grate area to heating surface to be 1 to 65 approximately.

The E. Keeler Company, Williamsport, Pa., secured the contract for this installation and 12 Keeler water tube boilers were installed, six in each plant in batteries of two each. One of the batteries of the Miraflores plant is shown in the accompanying engraving. These boilers were erected in special steel casings entirely inclosing the front, sides and rear and lined with 2 in. of magnesia block and 9 in. of fire brick. After the canal is in operation these steam plants, which are probably the largest ever built for construction purposes, will be maintained as an auxiliary for the permanent operation of the locks.

On March 3, 1910, the acceptance test was made on one of the boilers at the Miraflores plant, at which the efficiency obtained on the basis of the contract requirements was 82.36 per cent. At this test the horsepower developed by the boiler was 569.97, or almost 43 per cent. in excess of its rating. The equivalent evaporation from and at 210 degrees F. per pound of combustible was 13.33 lb.

Rolling Mill Machinery

Improvements Made in Its Construction During the Past Decade

In a recent issue of *Stahl und Eisen,* Director H. Ortmann of Völklingen dealt specially with the improvements which the last ten years have witnessed in the equipment of rolling mills. For convenience he has divided the subject into four parts — rolling machinery proper, the transmission system, the motor and all the appliances serving to convey the ingot, billet or

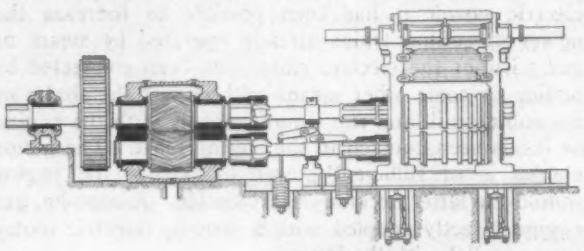


Fig. 1.—A New Type of Roll Stand.

bar to be rolled, at its various stages until it becomes a merchantable article.

Rolling mill housings have not undergone many changes recently. The position of the rolls has in general remained the same but the bearings have been enlarged and widened where it has been practicable, to reduce the pressure per unit of area. The roll stands have been more securely fastened, and the dimensions at the base increased. In the case of reversing rolling mechanisms the stands have been reinforced by strong cross frames above the rolls as in Fig. 1 so that they can not move laterally nor rock, but form closed frames. For the balancing above the upper rolls various forms of construction have recently been used. The hydraulic cylinders have been placed near the top and connected by tie rods with the part built into the upper roll. The starting and balancing of the upper rolls is controlled by an electric motor.

Rolling Machinery Proper

In a form of construction designed by the Duisburger Maschinenbau Aktiengesellschaft, formerly Bechem & Keetman, intended for carrying out the principles outlined above, the threads of the upper and lower adjusting screws fit closely so that when the

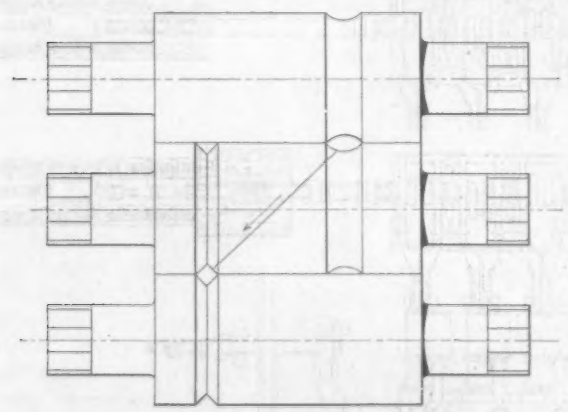


Fig. 2.—Schöpf's Arrangement Diagrammed, Showing the Course of the Work.

material passes between the rolls snapping of the screws and the resulting concussions are avoided.

Another notable improvement has been the use of guides for diverting the smaller sections rolled from one pass to the next. Formerly two forms of construction were chiefly used for small sections. These were the rolling mechanisms most common in Europe where a majority of the bars are inserted by workmen and in which only medium and small bars are automatically inserted by the guides, so that a large portion of the work has to be performed by skilled hands, and the continuous rolling mechanism originating from America which is not new and is practically automatic.

By the introduction of special guides which turn the bar either 90 or 45 degrees, the elements of a simplified and automatic rolling mechanism have been provided. This result has been attained by the form of construction patented by Herr Schöpf, Düsseldorf, diagrammed in Fig. 2. In front of the stand of rolls is a curved guide not shown but mounted on a vertical column. The bar coming from the upper oval opening enters the outlet guide and is turned through an arc of 90 degrees on the semi-circular track in the direction of the lower square opening. In another form of the process, square bars are given a 45-degree turn.

A wire rod rolling mechanism provided with guides as in Fig. 2 and constructed by Gebruder Klein, Dahlbruch, for a Rhenish cable factory, consumes on an average 162.5 kw. per hour, for the production of a ton of wire 5 mm. (0.19 in.) thick, from 130 mm. (5.11 in.) blocks. This figure is surprisingly low, but it might, however, be partially explained by the increased speed

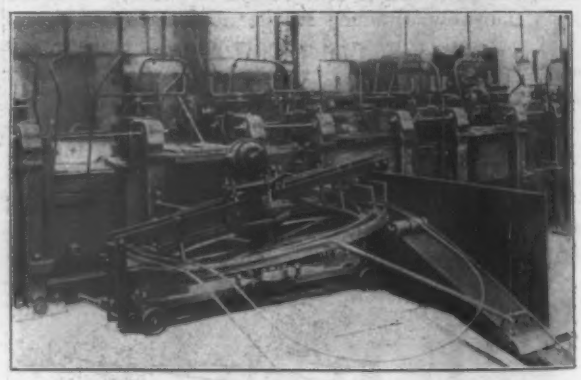


Fig. 3.—View of Tober's Guiding Arrangement for Rods.

of the rolling process attained with Herr Schöpf's guides and partly by the direct driving of separate portions of the rolling mechanism, thus eliminating all rope and belt transmissions.

A similar arrangement for guiding oval bars and specially adapted for soft materials like copper has lately been perfected and introduced by Herr Tober, Oberschöneweide. This system is also applicable to iron, particularly to quite small oval and flat bars as well as hoop iron. In this arrangement a rotary motion is applied to the guiding groove by a small overhead electric motor, the speed being as great or greater than that of the bar leaving the mechanism. This style of machinery is made by the firm of Fried. Krupp, A. G., Grusonwerk, Magdeburg, and is intended to deal with several bars at the same time. Details of this arrangement are given in Figs. 3, 4 and 5.

Power Transmission

In this part of rolling mill machinery there had been notable defects both in design and construction calling for a thorough reform. Figs. 1, 6 and 7 represent power transmissions for rolls designed from modern points of view, which Herr Ortmann suggests, comparing in detail with older machinery. In discussing various points of difference in rolling mill

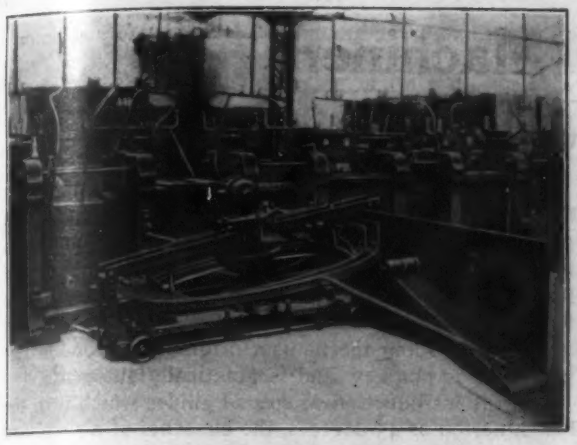


Fig. 4.—Another View of the Tober System.

equipment he calls attention to the fact that in the older rolling mills the solid spindles used in connection with the couplings were apt, if they broke, to cause damage to the engine shaft, the frame and the fly wheel. With the couplings shown in these engravings these defects are avoided; the solid spindles being eliminated and replaced by hollow spindles or similar appliances.

In rolling mills making tool and high grade steels where rapid changes in the position of the rolls are required and where friction couplings are used a new electromagnetic friction coupling designed under the Watzke patent by Salau & Birkholz, Essen-Ruhr, has been adopted and is illustrated in Fig. 8. In this coupling all the levers generally required for pressing the cone disks against each other are eliminated. The two cones, one of which is firmly fixed to one axle and the second movably attached to the other, are drawn toward each other by a stationary electromagnet. By cutting off the electric current the coupling is easily released, a spring forcing the two friction disks apart. In contrast with other electromagnetic friction couplings the advantage claimed for this model is that no grinding rings or brushes are employed. A similar electromagnetic coupling, but with rotating magnets and employing grinding rings and brushes, is made by the Berlin-Anhaltische Maschinenfabrik.

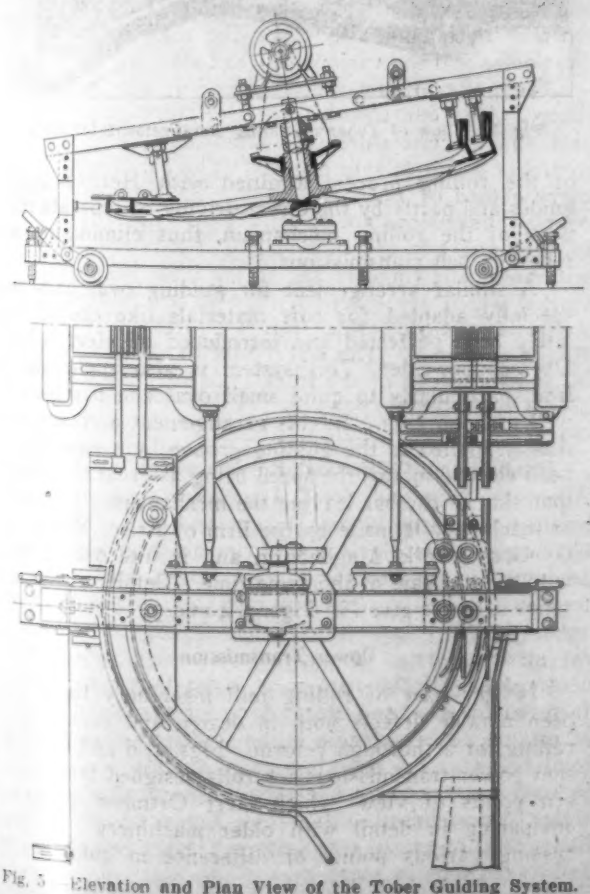


Fig. 5.—Elevation and Plan View of the Tober Guiding System.

The Motor

The adoption of electric motors in rolling mills has produced many changes stimulating the builders of steam engines to develop the working capacity of the latter and resulting in the introduction of notable improvements during the last ten years. By the aid of electric power it has been possible to increase the power of rolling trains already operated by steam or gas. Either the electric motor has been connected by belting or some other means with one of the shafts of the rolling mill and run simultaneously with the engine or it has been coupled to the engine shaft. The motor chosen is of sufficient power to replace the engine should the latter become unserviceable. A 2000-hp. gas engine directly coupled with a 2000-hp. electric motor runs parallel with the latter.

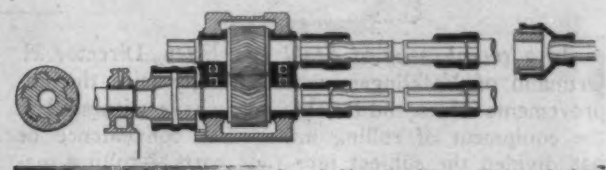


Fig. 6.—A New Type of Roll Stand, Showing Power Transmission.

The gas engine has been also extensively adopted in rolling mills, but only for trains running in one direction. The prejudice which was long entertained against this class of engine seems to have been the result of selecting too small a size; a like experience applying to electric motors. As gas engines must not be overloaded they should be chosen of higher power than the maximum expected. According to Herr Ortmann's experience where gas engines have been large enough originally and were constructed on the basis of experience they have given satisfaction and have seldom got out of order.

Prominent among the improvements made during the last ten years, are those in the regulating arrangements of reversing steam engines in which Ehrhardt & Sehmer, Schleifmühle, near Saarbrücken, as well as Sach & Kiesselbach, have been prominent.

Conveying and Finishing Apparatus

In taking up this final portion of the subject, Herr Ortmann first deals with the question of roll drives, remarking that a long time elapsed before transmission appliances, pure and simple, were radically improved. The position and dimensions of the journals and shafts were so faulty and old fashioned that considerable wear and fractures of the different parts were to be anticipated. The rolls driven by gears and their driving shafts have now been so designed and placed that the wear in any direction has become quite limited. In some cases ring-oiled bearings have been employed, arranged of late for the use of Kalypsol or similar lu-

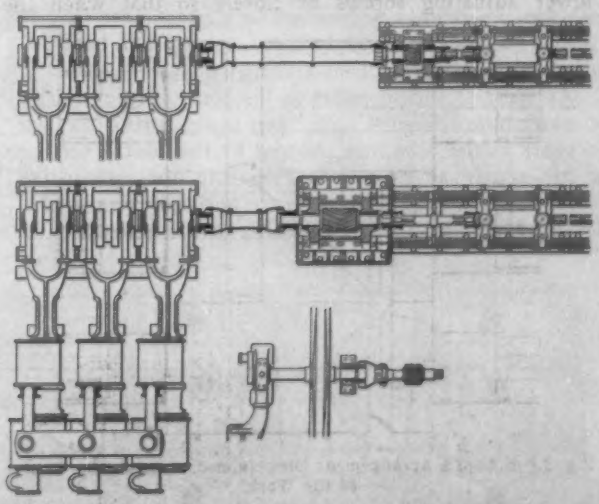


Fig. 7.—A Modern Design of Power Transmission for Rolling Mills.

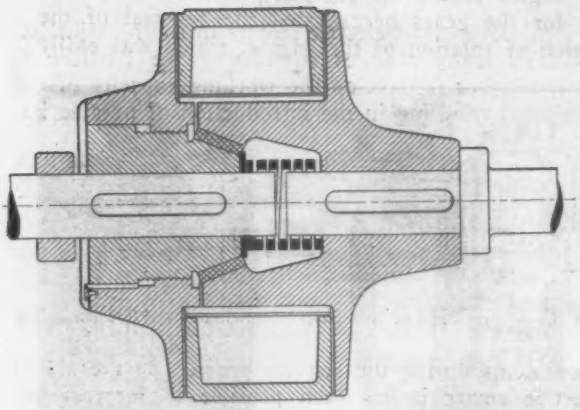


Fig. 8.—The Watzke Patent Friction Coupling.

bricant, and the results obtained have been satisfactory. In place of a gear drive for the separate rolls a crank drive which has been extensively adopted of late years has been designed and built by the Duisburger Maschinenbau Aktiengesellschaft.

The lifting tables used in connection with rolling trains in front of the frame were formerly operated by steam or hydraulic power, but lately electric motors have been used for the purpose. To avoid starting and stopping the motor, a friction coupling has been introduced which acts when the elevator is to be put in motion or stopped. Modern forms of construction are alike in this respect.

Block shears were formerly operated by hydraulic power, but during the last ten years they have been gradually improved, being now made to cut up instead of down, which results in greater steadiness. The newest electrically driven model is shown in Fig. 9 and is constructed by the Duisburg firm already mentioned. Rotating shears have been made by the Gewerkschaft Deutscher Kaiser with the disk revolving at the same speed as the roll.

Other methods are referred to, including the transportation of material by rails with eccentric movement. Among many other new features of rolling mill equipment during the last 10 years are the improved appliances for straightening rails, beams and other articles. Presses were formerly used, and much depended upon the skill of the workman. The automatic machines originally employed in America did not gain a footing in Germany, but German manufacturers now make machines through which a single pass suffices to straighten a large percentage of rails, while the remainder can readily be finished in a press near by. A speed of a meter (39.37 in.) per second has been attained with this five-roll machine.

As Herr Ortmann states in his concluding remarks, so many improvements have been made during the last 10 years in the direction covered by the fourth section of his article as to call for separate and exhaustive treatment. While his remarks are here necessarily condensed, Herr Ortmann's discussion of the general question contains a large amount of detailed information on all the points dealt with.

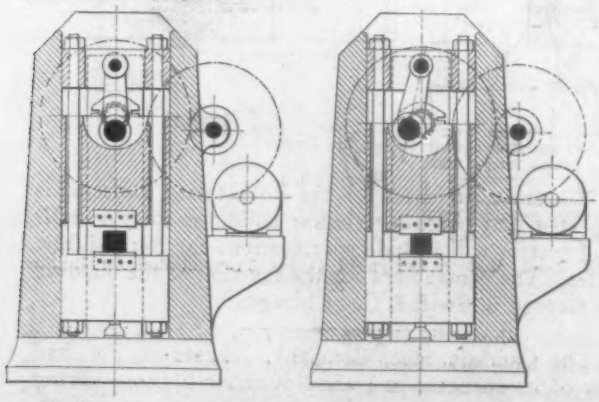


Fig. 9.—Block Shears with Movable Upper Blade for Cutting from Below.

Kilbourne & Jacobs Special Steel Tunnel Car

An order for 500 steel cars of the type shown in the accompanying engraving has recently been completed by the Kilbourne & Jacobs Mfg. Company, Columbus, Ohio. These cars are intended for handling freight in the tunnel of the Illinois Tunnel Company, which is laid out through the entire business district of Chicago, and are made up into trains drawn by electric locomotives. An illustrated description of this tunnel system appeared in *The Iron Age*, August 4, 1904.

Two of the special features in the design of these cars were occasioned by the fact that the radius of some of the curves is as small as 15 ft., which is also complicated because there is not a sufficient clearance to permit superelevation of the track and the diverse character of the material handled. In addition to handling general merchandise and manufactured products these cars also carry the coal supply to and remove the ashes from the large office buildings in the downtown districts and also carry the mail between the Post-office and the various railroad stations.

An All-Steel Car for Freight Tunnel Work Built by the Kilbourne & Jacobs Mfg. Company, Columbus, Ohio.

These varied uses require a car of very adaptable design. The one shown is of steel throughout. The side and the end shield are removable, being riveted to stakes which fit into pockets. The cars are built to carry a load of 15,000 lb. and weigh 3610 lb. Their over-all dimensions are 12 ft. 5⅞ in. long, 5 ft. 1 5-16 in. high and 3 ft. 9½ in. wide. The cars are equipped with automatic couplers and spring draft gear, and the trucks, which are spaced 6 ft. 3 in. on centers, have Andrews cast steel side frames and the bolsters are also of cast steel. The wheel base of the trucks is 27 in. and the gauge of the track is 24 in. The diameter of the truck wheels is 14 in.

Production of Charcoal Bloomaries in 1909.—The American Iron and Steel Association finds that the production of iron blooms, billets, and bars in charcoal bloomaries from pig iron or from pig iron and scrap, amounted in 1909 to 56,365 gross tons, against 55,973 tons in 1908, 84,623 tons in 1907, and 94,999 tons in 1906. It will be seen that there has been a decline in the manufacture of hammered charcoal blooms in recent years. Of the 1909 total, 9,593 tons was manufactured for sale, and 46,772 tons for the consumption of makers. Pennsylvania is the principal producer, its total being 44,146 tons last year, against 46,144 tons in 1998 and 71,099 tons in 1907. The other producing states, Massachusetts, Maryland, Kentucky, and Ohio, had a total of 12,219 tons last year, 9,829 tons in 1908, and 13,524 tons in 1907.

A Dodge Short Center Rope Drive

At the strawboard and wrapping paper mill of the Lawrence Paper Company, Lawrence, Kan., three beaters are belt driven from a line shaft in the basement. This shaft is arranged to be driven either by an electric motor or by a steam engine. For a number of years the engine alone was used, but it is now kept in reserve for the days when low water reduces the supply of current from the hydroelectric plant.

The particular interest centers around the engine

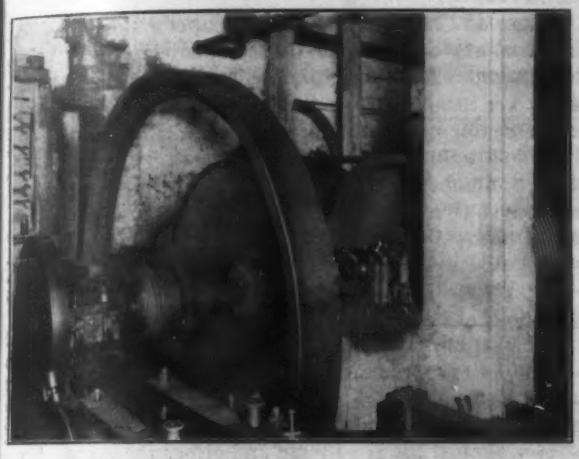


Fig. 1.—Short Center Rope Drive at the Mill of the Lawrence Paper Company Installed by the Dodge Mfg. Company. Mishawaka, Ind.

and its connections, as it is here that the short center rope drive illustrated herewith was installed by the Dodge Mfg. Company, Mishawaka, Ind. Figs. 1 and 2 give views of the drive from opposite ends, while Fig. 3 shows the details. The engine runs at 85 rev. per min. and the line shaft at 142 rev. per min. At first this difference in speed and the lack of room for a long rope drive led to the installation of a pair of spur gears having 98 and 59 teeth respectively with a pitch of 2½ in. and a face width of 11½ in. Considerable trouble was experienced with these gears as well as noise, since the load is subject to large and sudden fluctuations inseparable from the work of pulping straw, jute and other fibrous materials. In installations of this kind to avoid shock both a flywheel and an elastic drive are essential. The engine had the first, but the gears could not supply the latter, and consequently the fluctuations in load frequently broke gear teeth.

In addition to the breaking of the teeth there was also a continuous loss of power in friction and this led to the installation of a 250-hp. Dodge American system rope drive to replace these gears. As there was only 62½ in. between the centers this was the only practicable solution of the problem, combining the adaptability to a small working space with the elasticity for enduring and absorbing shocks. The sheaves were made as large as could be used in the small space, the rim flanges having only running clearance. The rope makes 19 wraps around the sheaves and the tension equipment is so arranged that the carriage runs on a horizontal track from the rear wall at right angles to the drive. The substitution of rope drive for the gears necessitated the reversal of the direction of rotation of the engine, which was easily

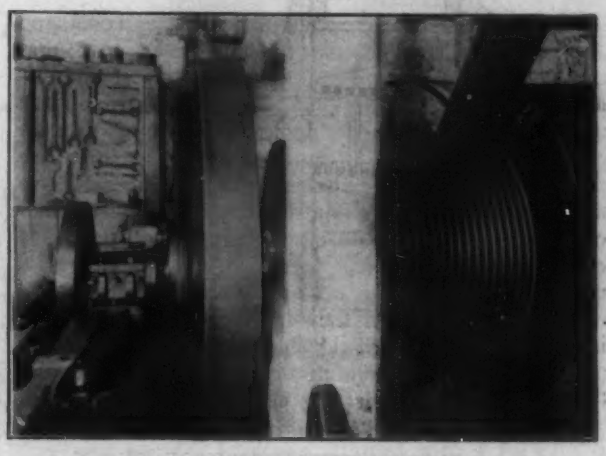


Fig. 2.—The Driven End of the Drive.

made, but previous conditions were not changed in any other way.

When the motor does the driving, as was the case at the time the photographs which are reproduced were taken, the engine is disconnected at the crank pin and the eccentric and the line shaft drives the flywheel through the rope drive. In this way the balancing effect of the momentum in the rotating wheel is retained.

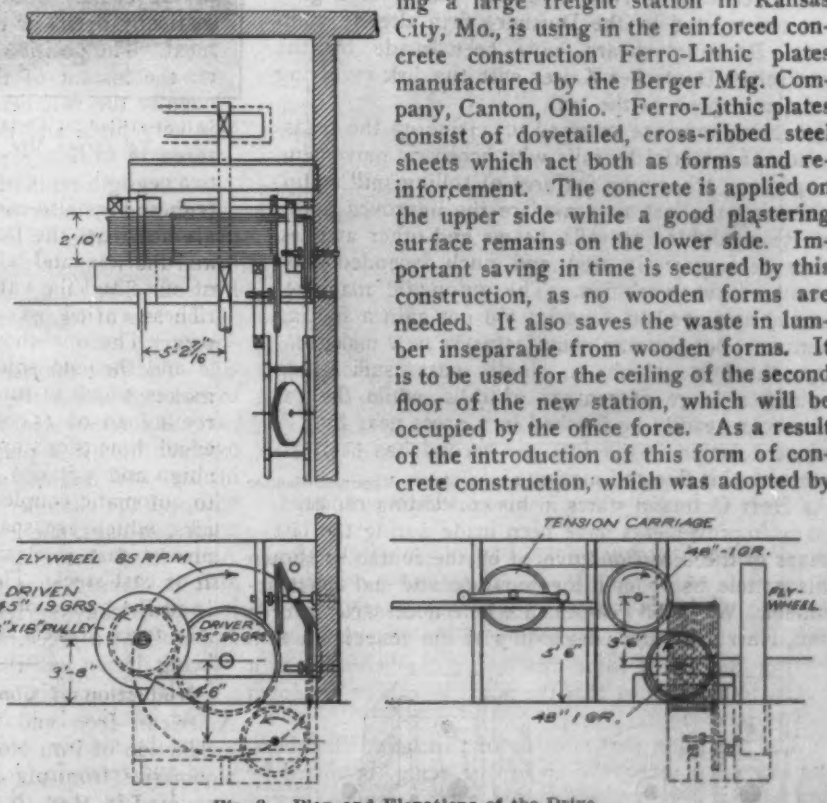


Fig. 3.—Plan and Elevations of the Drive.

Ferro-Lithic Plates for Concrete Construction

The Rock Island Railway Company, which is building a large freight station in Kansas City, Mo., is using in the reinforced concrete construction Ferro-Lithic plates manufactured by the Berger Mfg. Company, Canton, Ohio. Ferro-Lithic plates consist of dovetailed, cross-ribbed steel sheets which act both as forms and reinforcement. The concrete is applied on the upper side while a good plastering surface remains on the lower side. Important saving in time is secured by this construction, as no wooden forms are needed. It also saves the waste in lumber inseparable from wooden forms. It is to be used for the ceiling of the second floor of the new station, which will be occupied by the office force. As a result of the introduction of this form of concrete construction, which was adopted by H. T. Hawk, architect for the Rock Island Lines, it is expected that hereafter similar buildings for this railroad system will include specifications for Ferro-Lithic plates. The contractors for the erection of the building are George B. Swift & Co., Chicago.

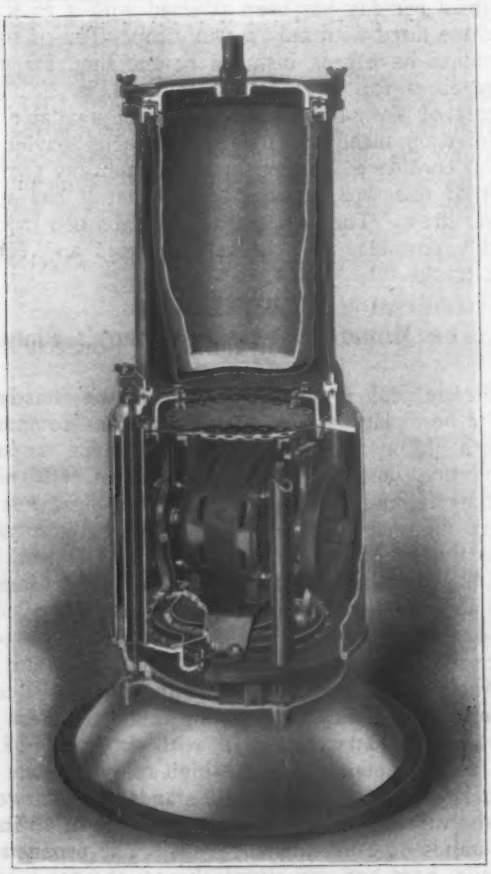
The Cambria Steel Company, Johnstown, Pa., had four of its furnaces in blast November 1, three having been blown out last month—on October 22, 23 and 28, respectively.

The Keller Duplex Vacuum Cleaner

A New Design with the Pumps Superposed

Announcement was made under New Tools and Appliances in *The Iron Age*, September 15, 1910, that the Keller Mfg. Company, Twenty-first street and Allegheny avenue, Philadelphia, Pa., had placed on the market a new type of duplex diaphragm vacuum cleaner. The special advantages of the machine are that it is entirely self-contained, the working parts are arranged in a vertical line and balanced so that the machine is steady and smooth running, the suction is constant, and the central portion of the diaphragm is not rigidly connected to any of the moving parts.

As will be seen from the engraving, which shows the interior construction of the cleaner, it consists of three parts: the base, the middle or operating portion and the upper or dust collecting chamber. The base is a



Broken View Showing the Interior of the Santo Vacuum Cleaner Made by the Keller Mfg. Company, Philadelphia, Pa.

round conical casting 23 in. in diameter and is shown broken away so that the general details and construction can be clearly seen. This type of base affords sufficient spread and weight to give the machine a firm bearing and at the same time avoid the necessity of a special foundation so that the machine can be set down on any level floor.

The operating part consists of two pump chambers, one above the other, the upper one being supported by four tubular columns, which also serve as a passageway for the air from the vacuum chamber to the lower pump. A substantial bracket or bridge supports a ¼-hp. motor, designed especially for this machine, between the two chambers. The ⅝-in. motor shaft extends beyond its bearings at each end and carries double eccentrics which are machined from a single piece and keyed to the shaft. Steel ball bearing races and aluminum eccentric rods surround the eccentrics. These rods are four in number, two connecting with the upper pump and two with the lower. The eccentrics are 180 degrees apart on the shaft, and each revolution of the shaft gives two impulses to the pump or 2400 per min. The bearings are of liberal dimensions and are bushed with bronze. Each has a grease cup of sufficient capacity to operate the machine for several months without attention. The specially constructed ball bearing eccentrics have the balls uniformly distributed, and these are kept at equal distances by felt plugs which are impregnated with a heavy oil. In this way proper lubrication of the eccentrics for a long time is insured and additional lubricant is supplied to the bearing by simply putting a few drops of oil in each raceway.

Each of the pumps is of the maker's standard type and consists of a saucer-shaped chamber closed by a diaphragm. The two connecting links actuating the pump are attached to a ring which in turn is secured to the center of the diaphragm. The entire portion of the diaphragm inclosed within this ring is perforated with a number of ½-in. holes, and this perforated portion is covered by a galvanized steel plate having the same number and size of holes as the diaphragm, but located so that the holes in the plate and the diaphragm are not in line with each other. A galvanized wire netting is placed above the plate to limit the play of the diaphragm within the ring. When the moving portion ascends, the air is free to pass through the holes in the steel plate and across and up through the holes in the diaphragm, but on the return stroke the latter presses against the steel plate and closes the holes. The number and the size of these holes is so proportioned that free and unrestricted passage of the air is afforded without loss due to back pressure. In this construction it is claimed that when the connecting rods and the ring which are positive in their action start to move in either direction, the inertia of the slack diaphragm in the center of the ring causes a drag which automatically opens or closes the valves at the proper moment. The positive action of the pump is said to begin on the instant of the reversal of motion, and consequently the volumetric efficiency of this form of pump is very high, and the customary slippage loss encountered in ordinary piston or rotary pumps is reduced to a negligible quantity. The arrangement of the eccentrics and cylinder is said to be such that the two pumps are automatically balanced by the atmospheric pressure and the wear on the motor bearings reduced to a minimum. The pump mechanism is claimed to have a friction loss of less than 5 per cent. of the available motor power.

The dust chamber consists of a cylindrical steel shell mounted above the operating or pump portion and is readily removable by loosening the three thumb nuts which hold it in place. A lid locked in place by thumb nuts and sealed with a rubber gasket closes the top of the chamber. For separating the dust from the air two bags, one inside the other, are used. The inner one is of cotton drill and the outer one of heavy felt. It is claimed that the separation in this interior bag is practically perfect, and the outer felt one is used merely as a precaution to avoid any possibility of dust being drawn into the pump if the operator should carelessly replace the lid without returning the dust bag. The interior bag may be taken out for removing the dust by simply loosening the two thumb nuts on the lid and removing it.

In operation the dust-laden air enters the upper chamber through a 1½-in. pipe in the center of the lid. As soon as the air is relieved of its burden, part of it passes directly to the upper pump while the balance goes down through the supporting pipe columns to the lower one. After passing through the pumps the strained air is blown out around the motor and escapes through an opening in the casing. The inlet pipe is connected to the piping of the house or building by a 5-ft. length of 1½-in. rubber hose, which gives a connection preventing the transmission of any noise and

jar and also allows the lid of the machine to be removed without disturbing any connections.

The cleaner stands 40 in. over all and weighs 180 lb. Its capacity is 45 cu. ft. of free per min., and the vacuum produced is 8 or 9 in. mercury gauge.

A Pridmore Rock-Over Molding Machine

A new rock-over molding machine designed to carry a 22 x 18 in. flask has been placed on the market by Henry E. Pridmore, Chicago, Ill. This machine has a 12-in. draw which is 4 in. longer than the one previously furnished and permits the machine to handle unusually deep patterns and very materially increases

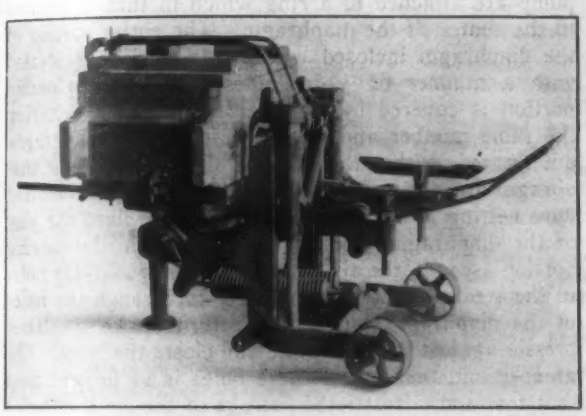


Fig. 1.—A Flask Rammed and Clamped Ready to Roll Over in the New Rock-Over Drop Molding Machine Built by Henry E. Pridmore, Chicago, Ill.

its scope and adaptability. Fig. 1 shows the flask rammed and clamped ready to roll over, Fig. 2 is a view showing the clamper released and the mold dropped away from the pattern, while in Fig. 3 the pattern is rolled back into position, and the mold is ready to be lifted away.

In Fig. 1 the bottom board is clamped in place by adjustable clamping rods. The rocking-over process

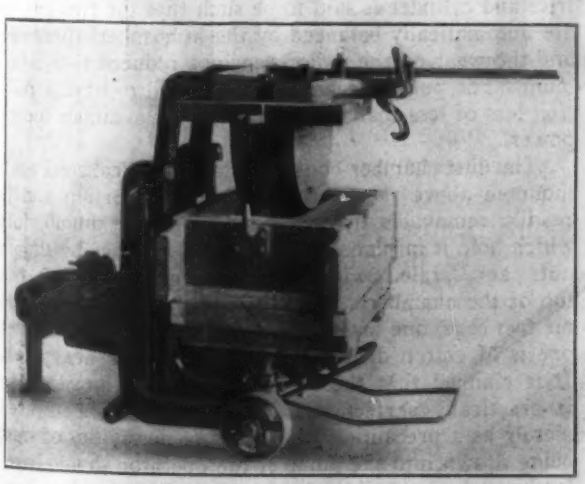


Fig. 2.—The Clamper Released and the Mold Dropped Away from the Pattern.

is assisted by the double extra heavy balance springs, and in Fig. 2 where the flask has been dropped away from the pattern the advantage of the deep drop is plainly shown. When the flask is dropped away from the pattern the latter comes out of the sand without tearing, thus leaving a clean true mold.

This machine is particularly adapted for molding pump cylinders, &c., and has also been used for molding two-barreled automobile engine cylinders complete in one casting with valve chambers on both sides. These cylinders are molded in a straight flask, and in their preparation three machines are used, one each on the

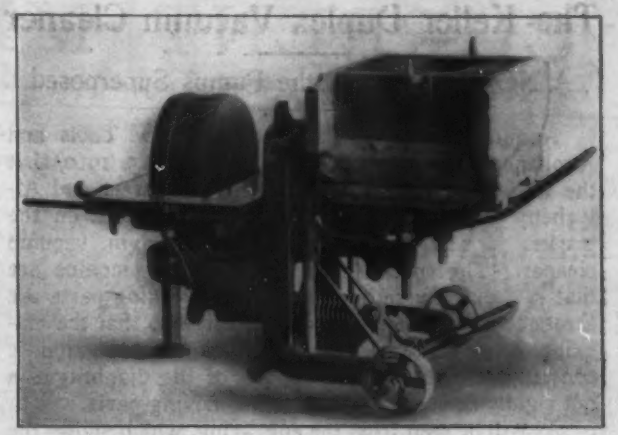


Fig. 3.—The Pattern Returned and the Mold Ready to Be Lifted from the Machine.

cope, the cheek and the drag. A record of 15 cylinders per man per day has been attained with a 16 x 14 in. machine fitted with only a 5-in. drop. Ten of the new machines have been installed in one shop for making large cores for air compressors, engines, &c., but no figures of the production are as yet available. The 12-in. drop machine can handle much heavier work and is considered a better machine than any previously built of this type, for the reason that it has a much larger draw. The new machine weighs 900 lb., but is readily portable, as it is well balanced and equipped with trucks.

The Minnesota Steel Company's Plant

Steady progress is being made in the construction of the new plant of the Minnesota Steel Company, at Duluth, Minn. The two blast furnaces, on which foundation work has been under way recently, will be 22 x 95 ft. and will be equipped with eight hot blast stoves. They will have a capacity of about 325,000 gross tons of basic pig iron a year. The steel plant will have seven 75-ton basic open hearth furnaces, with an annual capacity of 300,000 gross tons of ingots, and one 600-ton metal mixer. There will be two continuous regenerative bar heating furnaces and four four-hole soaking pits. The rolling mills will consist of one 40-in. reversing blooming mill, one 28-in. combined rail and structural mill, with six stands of two-high and two stands of three-high rolls, and one combined merchant mill, with nine stands of 16-in. roughing and three stands of 12-in., two stands of 10-in. and two stands of 8-in. finishing rolls. The products will be rails, bars and structural shapes, the total annual capacity being about 225,000 gross tons.

At the recent annual meeting of the National Rolling Mill Company, Mansfield, Ohio, H. L. Reed retired from the presidency, owing to the condition of his health, but remains on the Board of Directors. The following officers were elected: President, L. A. Ott; first vice-president, August Kochheiser; second vice-president, C. T. Moriarty; treasurer, P. J. Wigton; secretary, E. C. A. Reed. The officers and A. W. Monroe and Mr. Reed comprise the Board of Directors. The company is reported to be in a flourishing condition and its output has been contracted for until next March. The new corrugating plant is under roof and other extensions are planned.

The Whitney-Kemmerer Company, through its Cincinnati, Ohio, office, has closed contract with a prominent Southern furnace for approximately 4000 tons per month of its Wise County coke, for one year dating from January 1. This deal was made on the sliding scale basis.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1¾ in. round and square	₩ lb 1.90¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 1.90¢
1½ to 4 in. x ¼ to 5-16	₩ lb 2.10¢
Rods—⅝ and 11-16 round and square	₩ lb 2.10¢

Angles:	Cts ₩ lb
3 in. x ¼ in. and larger	2.10¢
3 in. x 5-16 in. and ⅜ in.	2.25¢
1½ to 2½ in. x ¼ in.	2.20¢
1½ to 2½ in. x 5-16 in. and thicker	2.10¢
1 to 1¼ in. x 5-16 in.	2.20¢
1 to 1¼ x ⅛ in.	2.30¢
⅝ x ⅛ in.	2.40¢
¾ x ⅛ in.	2.50¢
⅞ x ⅛ in.	2.55¢
½ x 3-32 in.	4.35¢

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.00¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black

	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 18	₩ lb 2.55¢	2.80¢
Nos. 16 to 20	₩ lb 2.70¢	2.90¢
Nos. 22 and 24	₩ lb 2.75¢	3.00¢
No. 26	₩ lb 2.80¢	3.10¢
No. 28	₩ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment, ₩ lb 13 @14½¢

Patent Planished, W. Dewees Wood. ₩ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₩ lb 2.95¢
Nos. 22 to 24	₩ lb 3.30¢
No. 26	₩ lb 3.50¢
No. 28	₩ lb 3.80¢

No. 29 and lighter 35 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₩ lb 5.35¢
No. 26	₩ lb 6.25¢
No. 28	₩ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.85	4.40
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.00
A. Charcoal:	
IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 107 lb	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 12, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 15, 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19¼¢ ₩ lb

High Brass Rods—

List August 1, 1908. 14¼¢ ₩ lb

Roll and Sheet Brass—

List August 1, 1908. 14¼¢ ₩ lb

Brass Wire—

List August 1, 1908. 14¼¢ ₩ lb

Copper Wire—

Base Price. Carload lots mill 14¼¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ lb 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished.

METALS—

Tin—

Straits Pig ₩ lb 3

Copper—

Lake Ingot	₩ lb 18½
Electrolytic	₩ lb 18
Castings	₩ lb 16½

Spelter—

Western ₩ lb

Zinc.

No 9, base, casks ₩ lb 8¼¢ | Open

Lead.

American Pig	₩ lb 5
Bar	₩ lb 6

Solder.

½ & ½, guaranteed	₩ lb 22½
No. 1	₩ lb 20
Refined	₩ lb 18½

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb
Hallett's	
Other Brands	

Bismuth—

Per lb $2.00@2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting

Rods & Wire Base Price

Sheets Base Price

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ lb 11.00
Copper, Heavy and Wire	₩ lb 10.75
Copper, Light and Bottoms	₩ lb 9.75
Brass, Heavy	₩ lb 7.50
Brass, Light	₩ lb 5.50
Heavy Mechine Composition	₩ lb 9.75
Clean Brass Turnings	₩ lb 7.50
Composition Turnings	₩ lb 8.50
Lead, Heavy	₩ lb 6
Lead, Tea	₩ lb 4
Zinc Scrap	₩ lb 4

NICHOLSON

We have had over forty years' experience in making Files and Rasps; we not only know what KIND of steel to use, but HOW to use it.

If NICHOLSON FILES did not hold their CUTTING edge—our order books would not hold so many CUSTOMERS.

We make over 3,000 different styles and sizes. Send for Catalog.

NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.